

SCHEMATIC DIAGRAM OF CONVENTIONAL EXCIMER LASER ANNEALER

FIG. 1 PRIOR ART

FIG.2A  
PRIOR ART

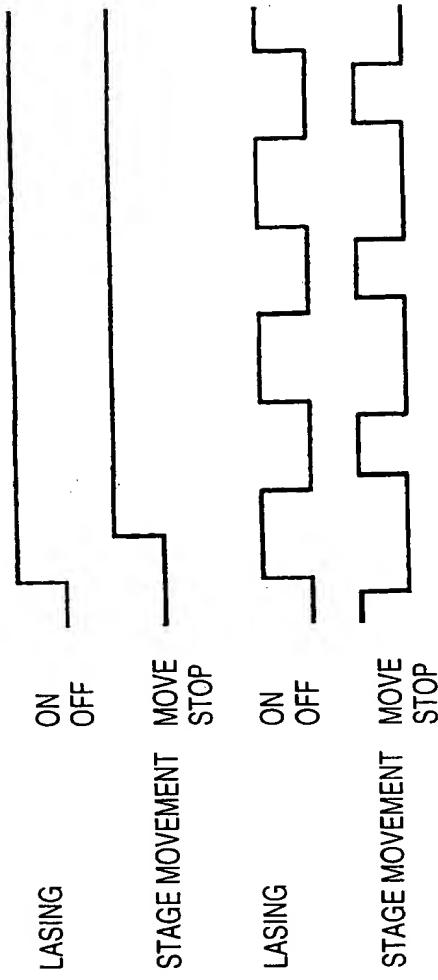


FIG.2B  
PRIOR ART

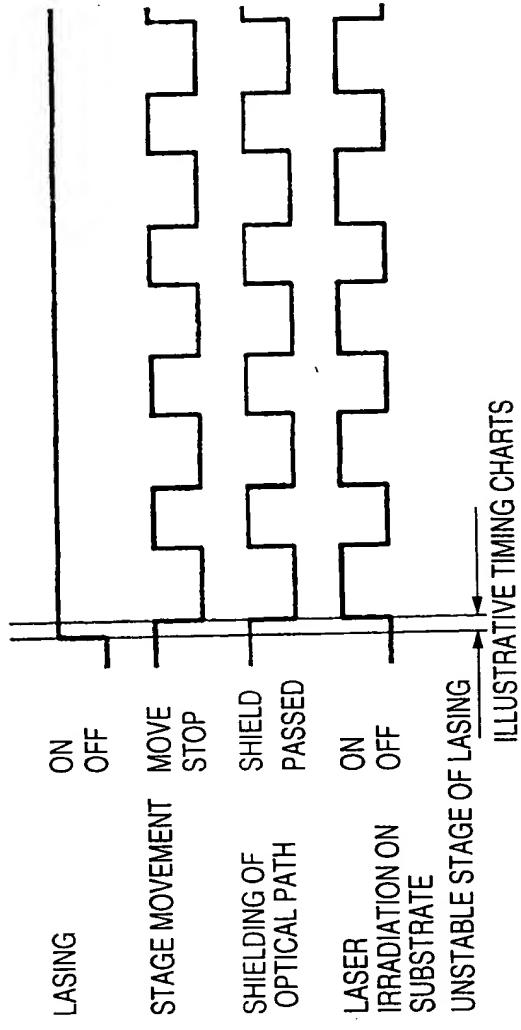


FIG.2C  
PRIOR ART

FIG.2D  
PRIOR ART

ILLUSTRATIVE TIMING CHARTS

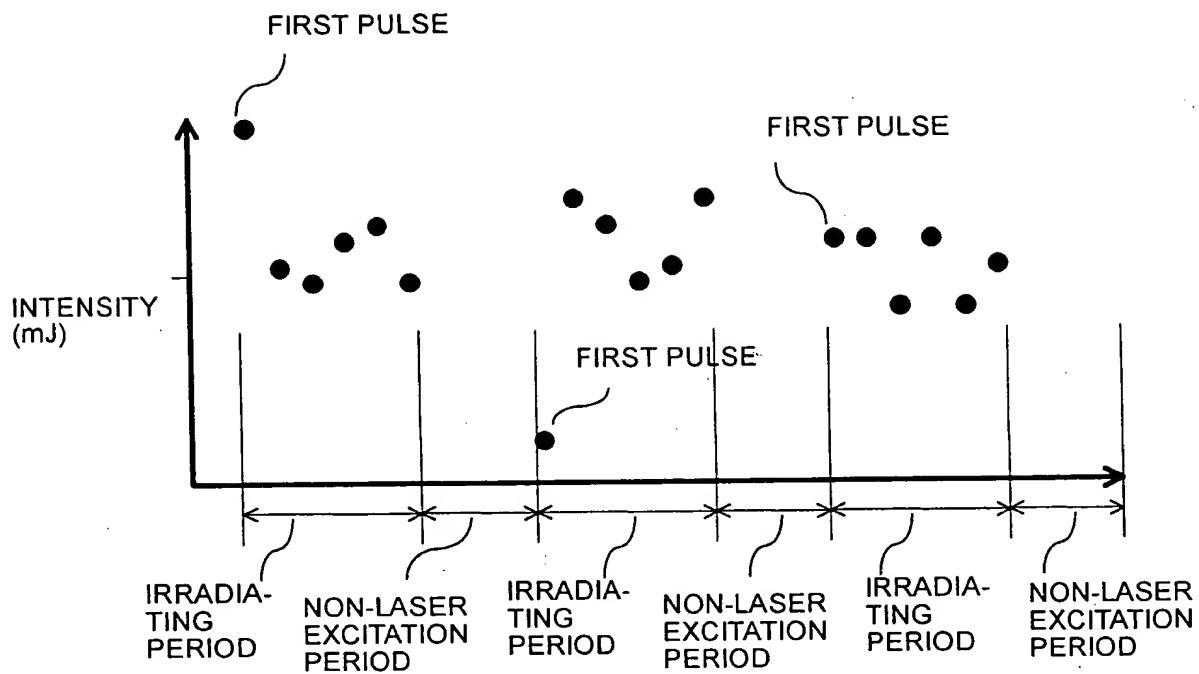


FIG. 3

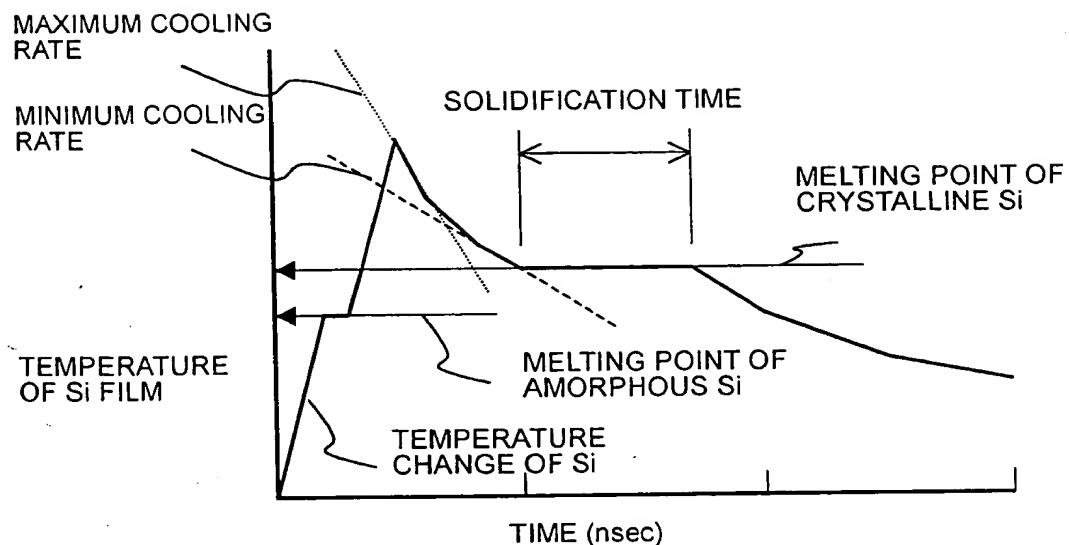
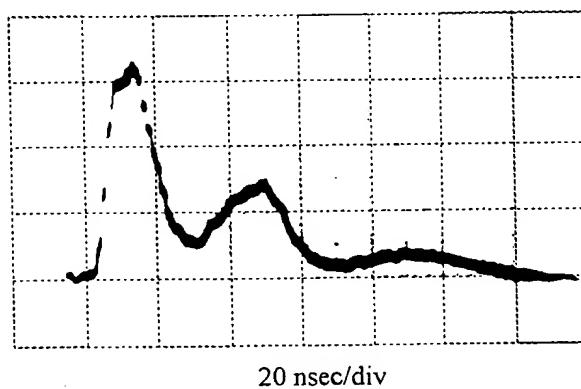
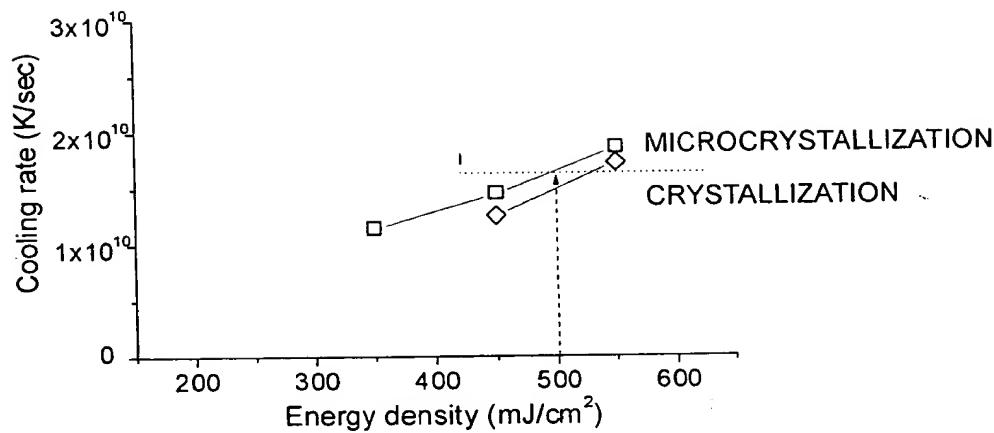


FIG. 4



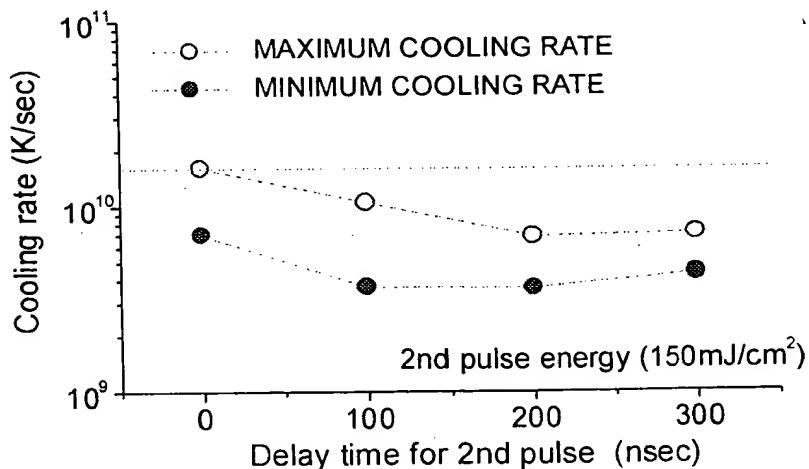
ILLUSTRATIVE LASER PULSE SHAPE

FIG. 5



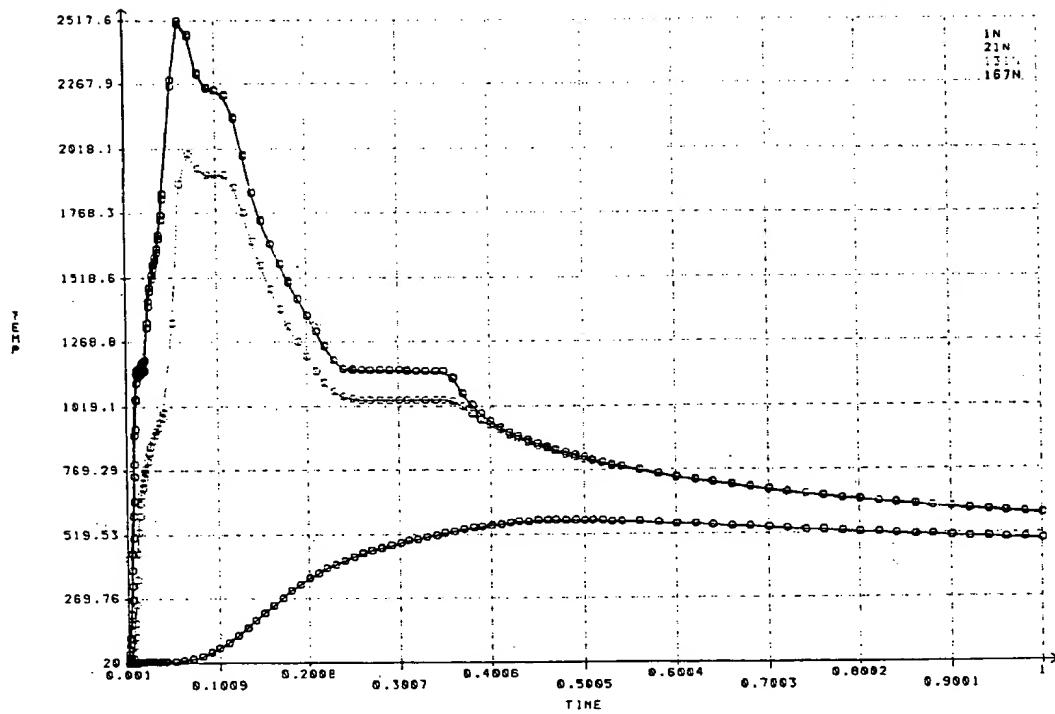
RELATIONSHIP BETWEEN IRRADIATION INTENSITY AND COOLING RATE,  
AND COOLING RATE AT WHICH THE MATERIAL BECOMES AMORPHOUS

FIG. 6



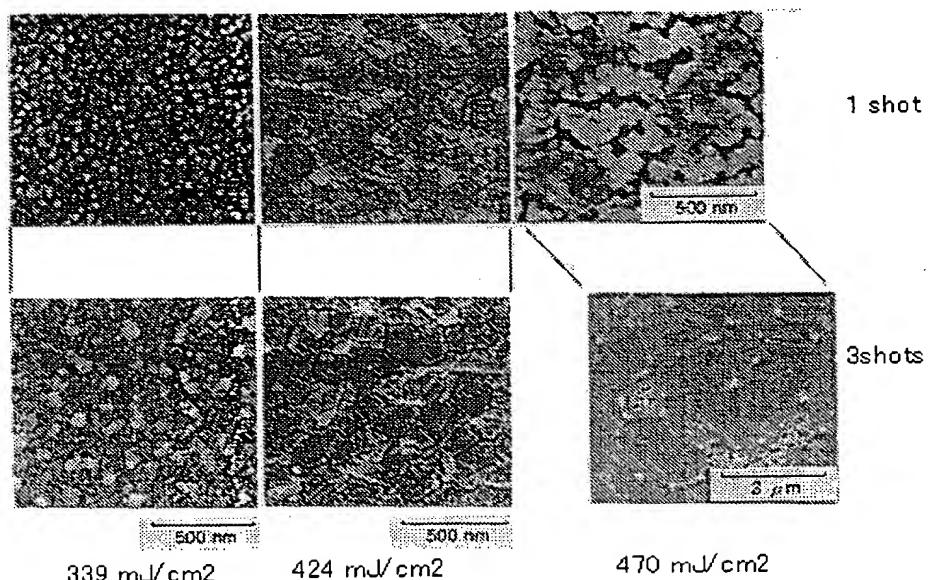
RELATIONSHIP BETWEEN MAXIMUM COOLING RATE AFTER  
APPLICATION OF SECOND PULSE AND THE COOLING RATE IN THE  
VICINITY OF SOLIDIFICATION POINT

FIG. 9



TEMPERATURE OF SILICON THIN FILM 75nm THICK ON A  
 $\text{SiO}_2$  SUBSTRATE IRRADIATED AT AN INTENSITY OF  
 $450\text{mJ/cm}^2$  BY XeCL LASER (WAVELENGTH: 308nm)

FIG. 7



ELECTRON MICROSCOPIC PHOTOGRAPHS OF LASER-INDUCED  
CRYSTALLIZED FILMS AFTER ZERO-ETCHING RELATIVE TO  
IRRADIATION INTENSITY AND NUMBER OF IRRADIATION TIME

FIG. 8

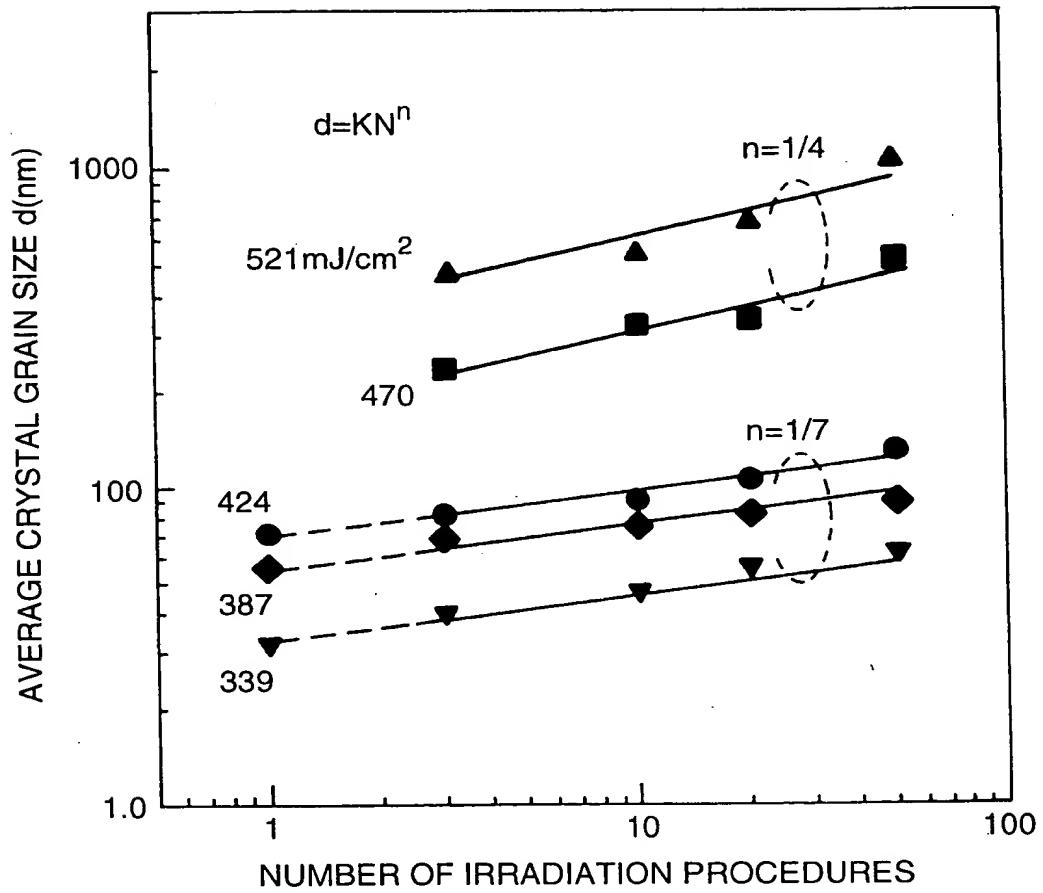
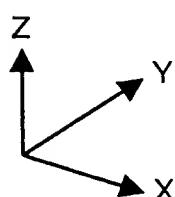
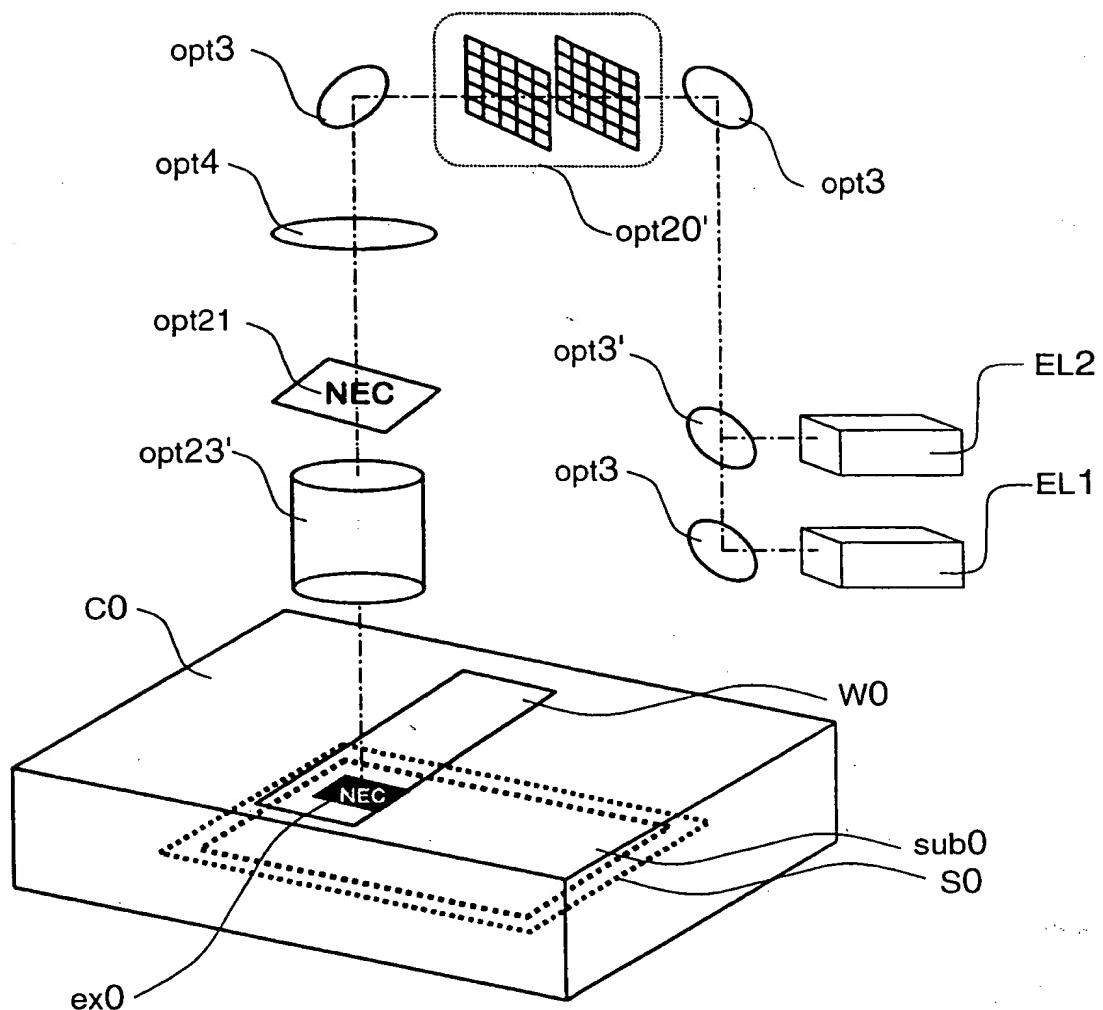
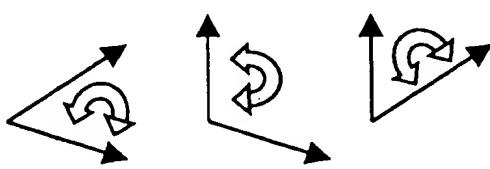


FIG.10



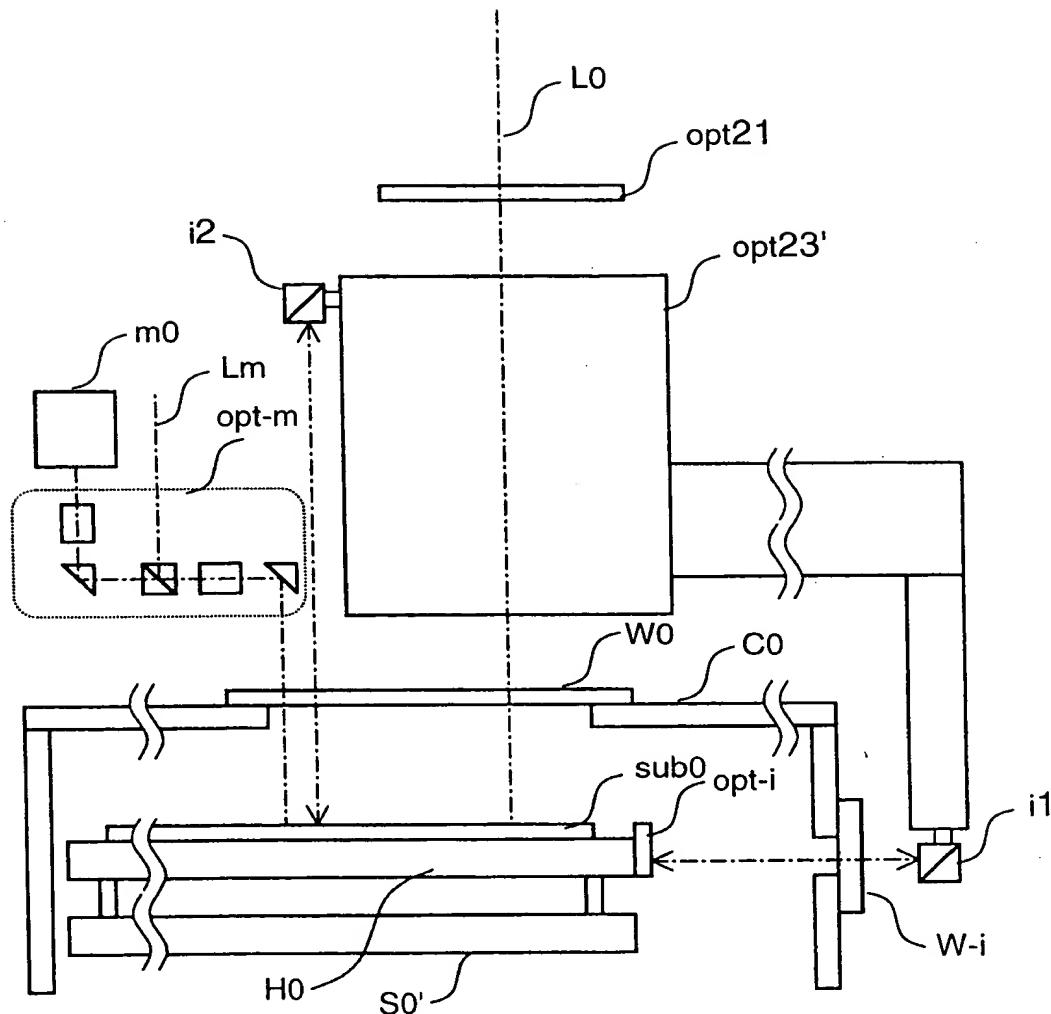
STAGE MOVING DIRECTION



STAGE TILT DIRECTION

EXCIMER LAYER IRRADIATOR

FIG.11



ALIGNMENT MECHANISM

FIG.12

FIG.13A  
MASK  
PATTERN

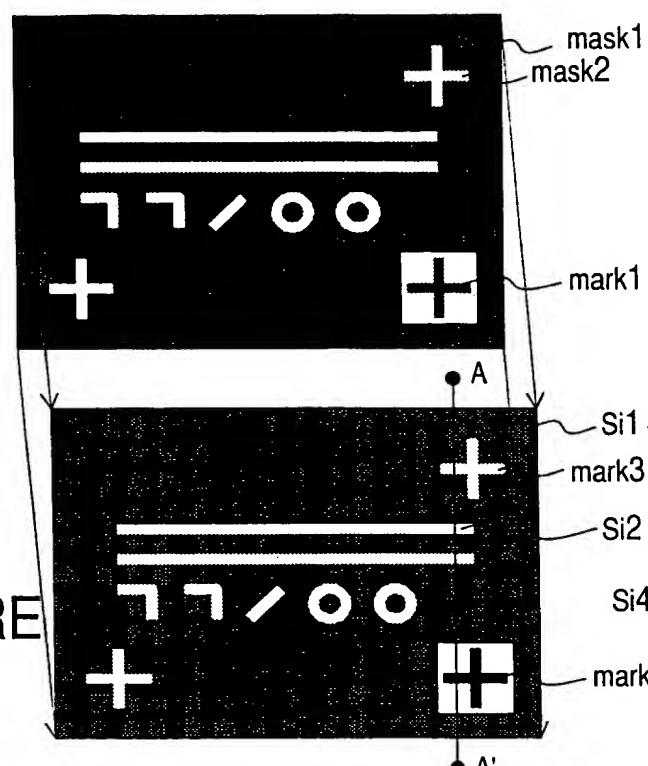


FIG.13B  
EXPOSURE  
PATTERN

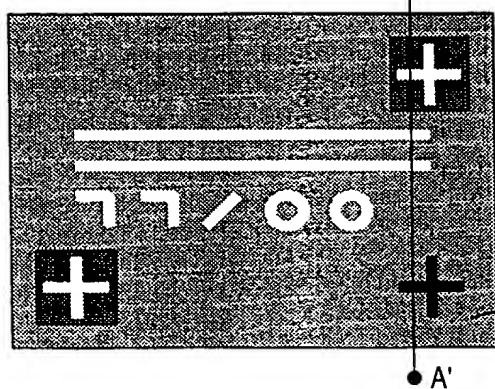


FIG.13D  
ETCHING  
PATTERN

A-A' CROSS SECTION

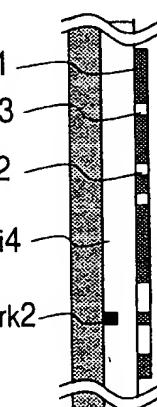


FIG.13C

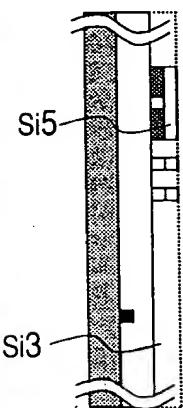
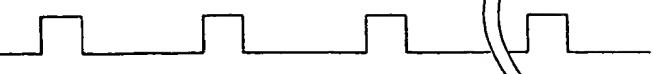
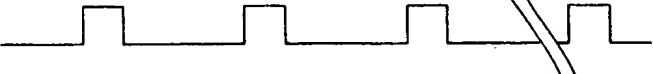


FIG.13E

PATTERN TRANSFER AND ALIGNMENT IN  
EXCIMER LASER ANNEALING

ILLUSTRATIVE CONTROL PROCEDURE (1)

SUBSTRATE STAGE OPERATION	ON	
ALIGNMENT, FOCUSING AND OTHER PROCEDURES	ON	
LIGHT IRRADIATION ON SUBSTRATE	ON	

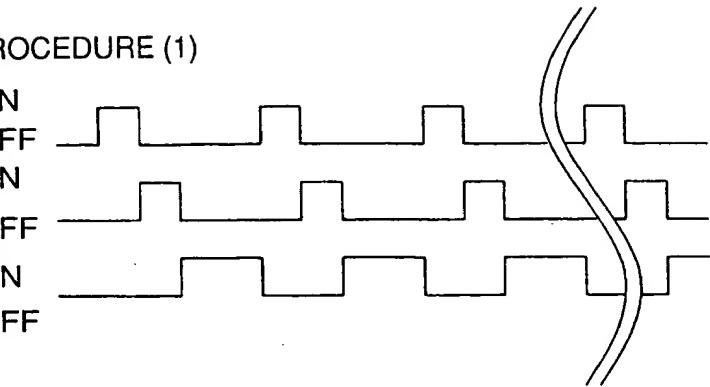
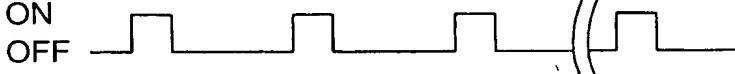
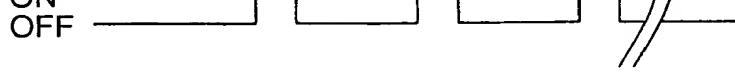


FIG.14A

ILLUSTRATIVE CONTROL PROCEDURE (2)

SUBSTRATE STAGE OPERATION	ON	
ALIGNMENT, FOCUSING AND OTHER PROCEDURES	ON	
MASK STAGE OPERATION	ON	
LIGHT IRRADIATION ON SUBSTRATE	ON	

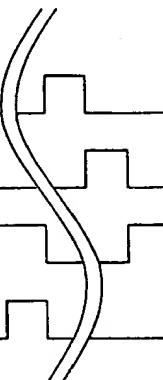
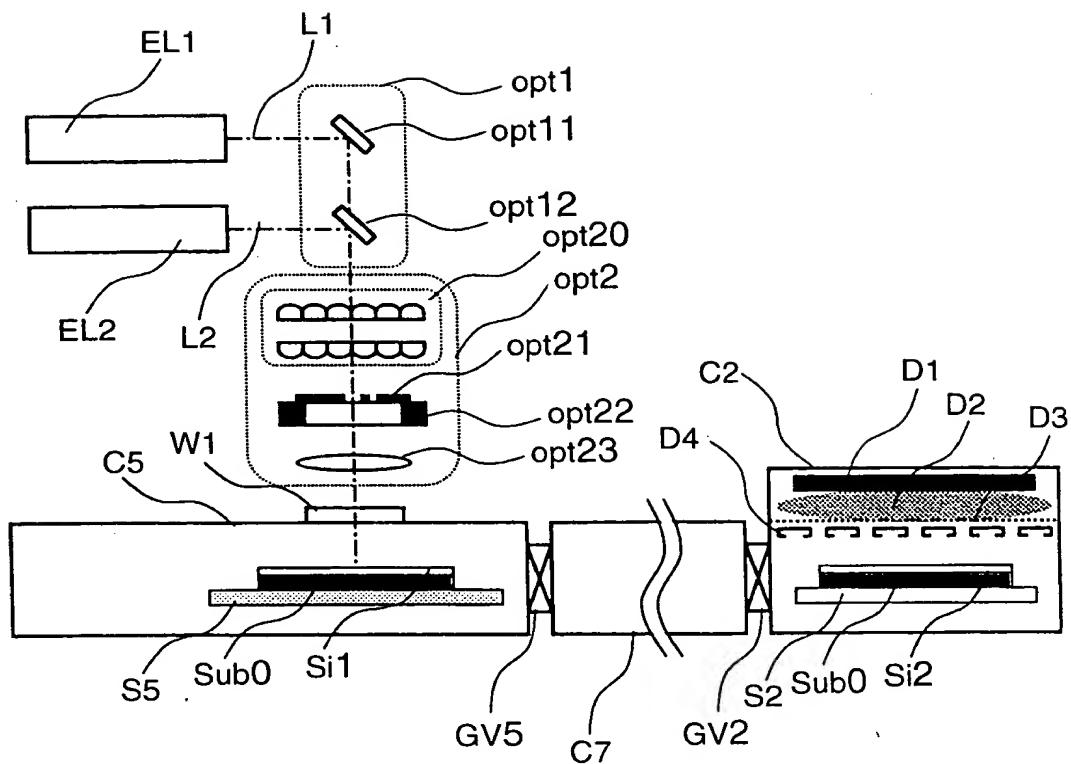


FIG.14B



PLASMA-ENHANCED CVD CHAMBER-SUBSTRATE TRANSFER  
CHAMBER-LASER IRRADIATING CHAMBER

FIG.15

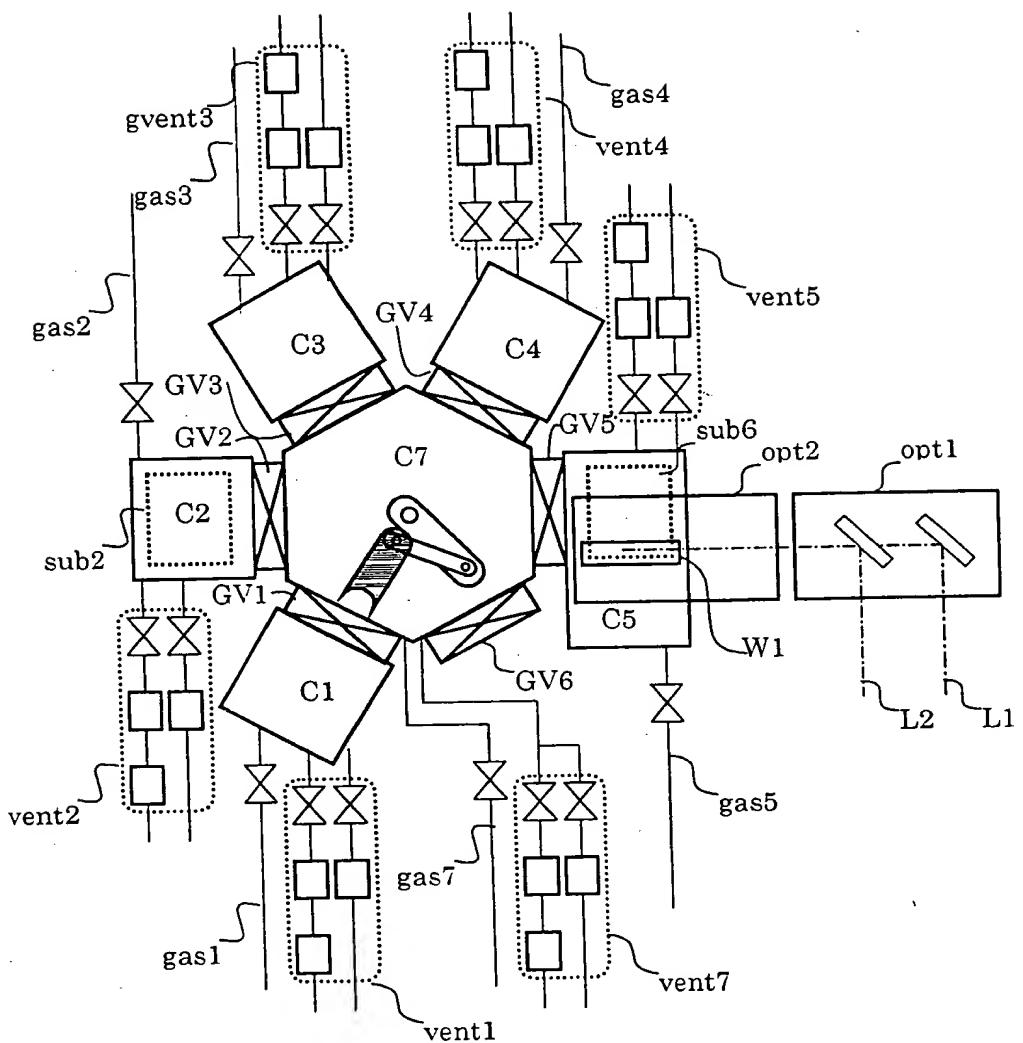


FIG. 16

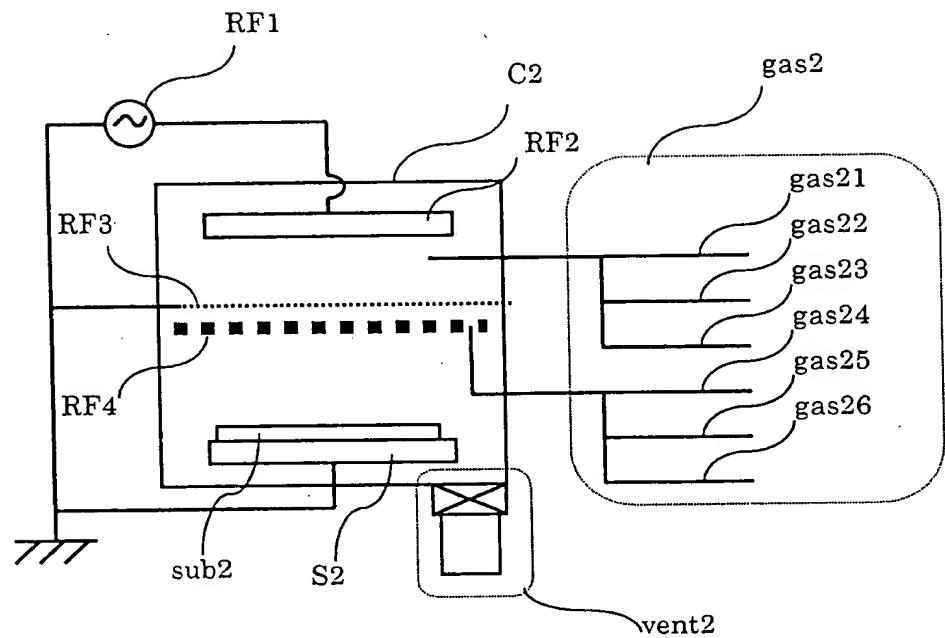


FIG. 17

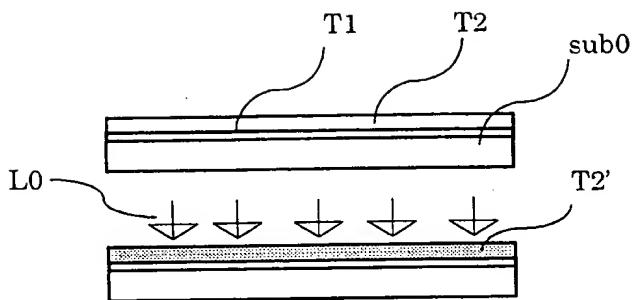


FIG. 18A

FIG. 18B

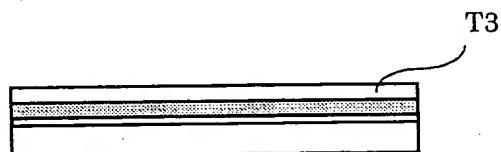


FIG. 18C



FIG. 18D

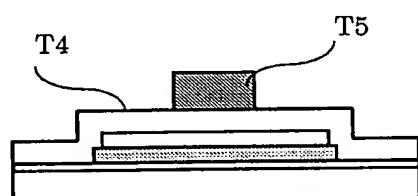


FIG. 18E

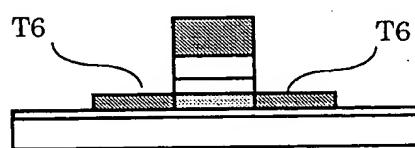


FIG. 18F1

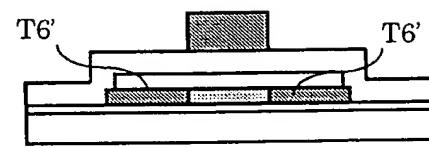


FIG. 18F2

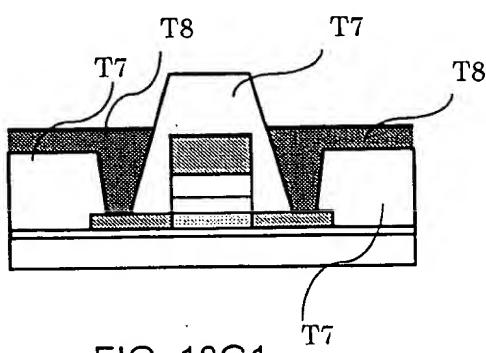


FIG. 18G1

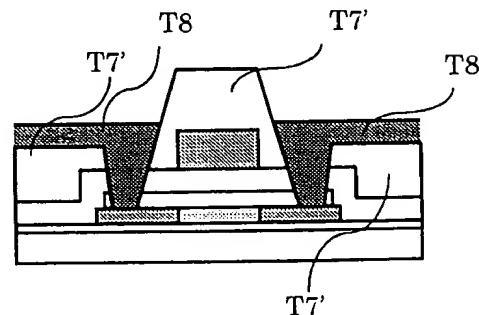


FIG. 18G2

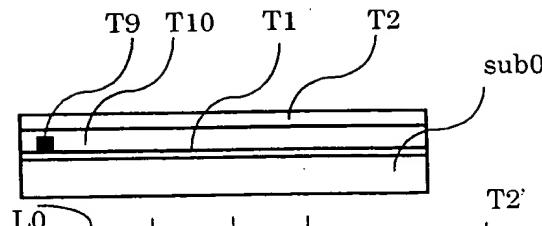


FIG. 19A

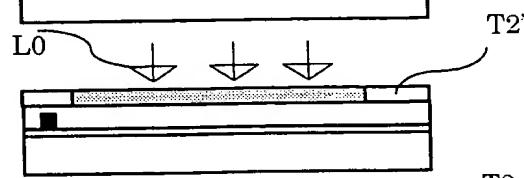


FIG. 19B

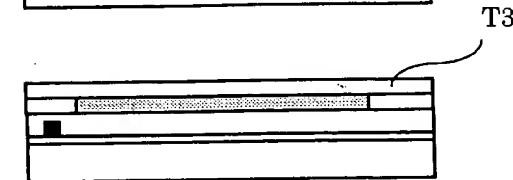


FIG. 19C

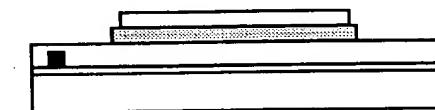


FIG. 19D

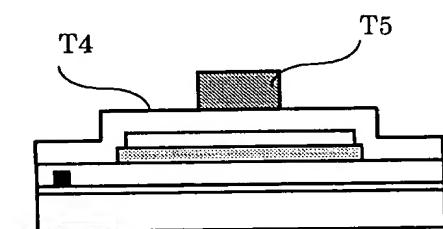


FIG. 19E

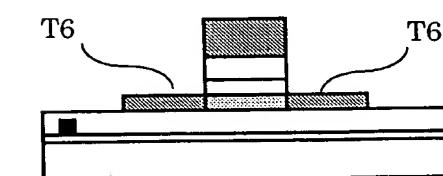


FIG. 19F1

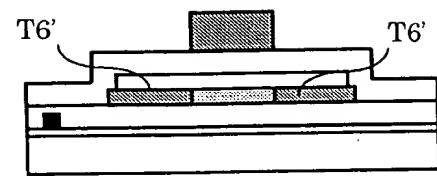


FIG. 19F2

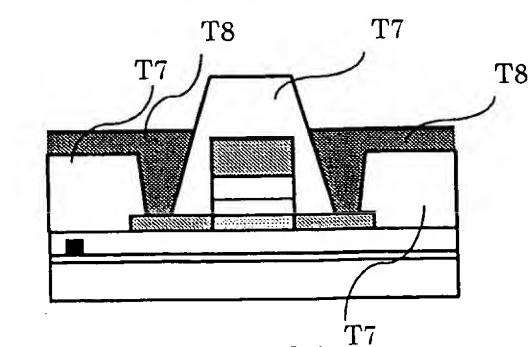


FIG. 19G1

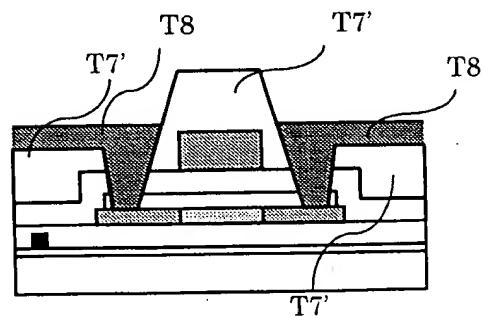


FIG. 19G2

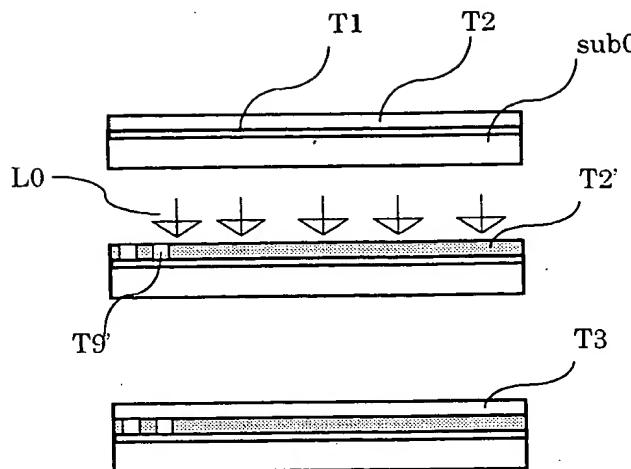


FIG. 20A

FIG. 20B

FIG. 20C



FIG. 20D

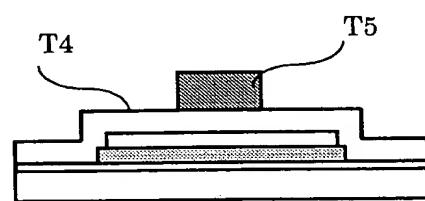


FIG. 20E

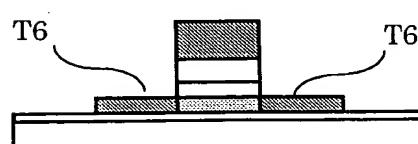


FIG. 20G1

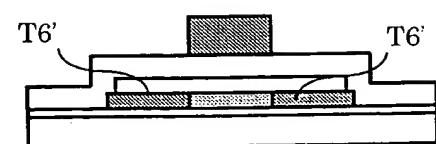


FIG. 20G2

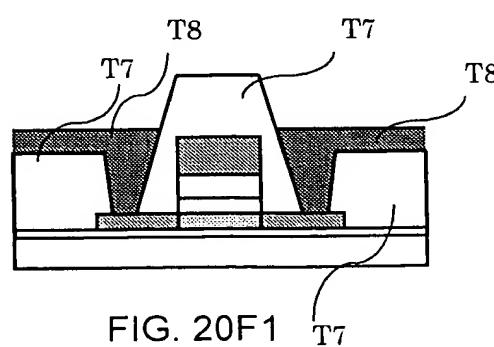


FIG. 20F1

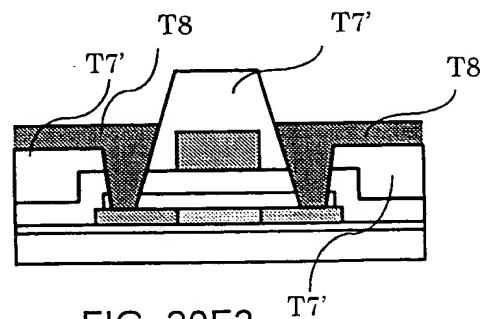


FIG. 20F2

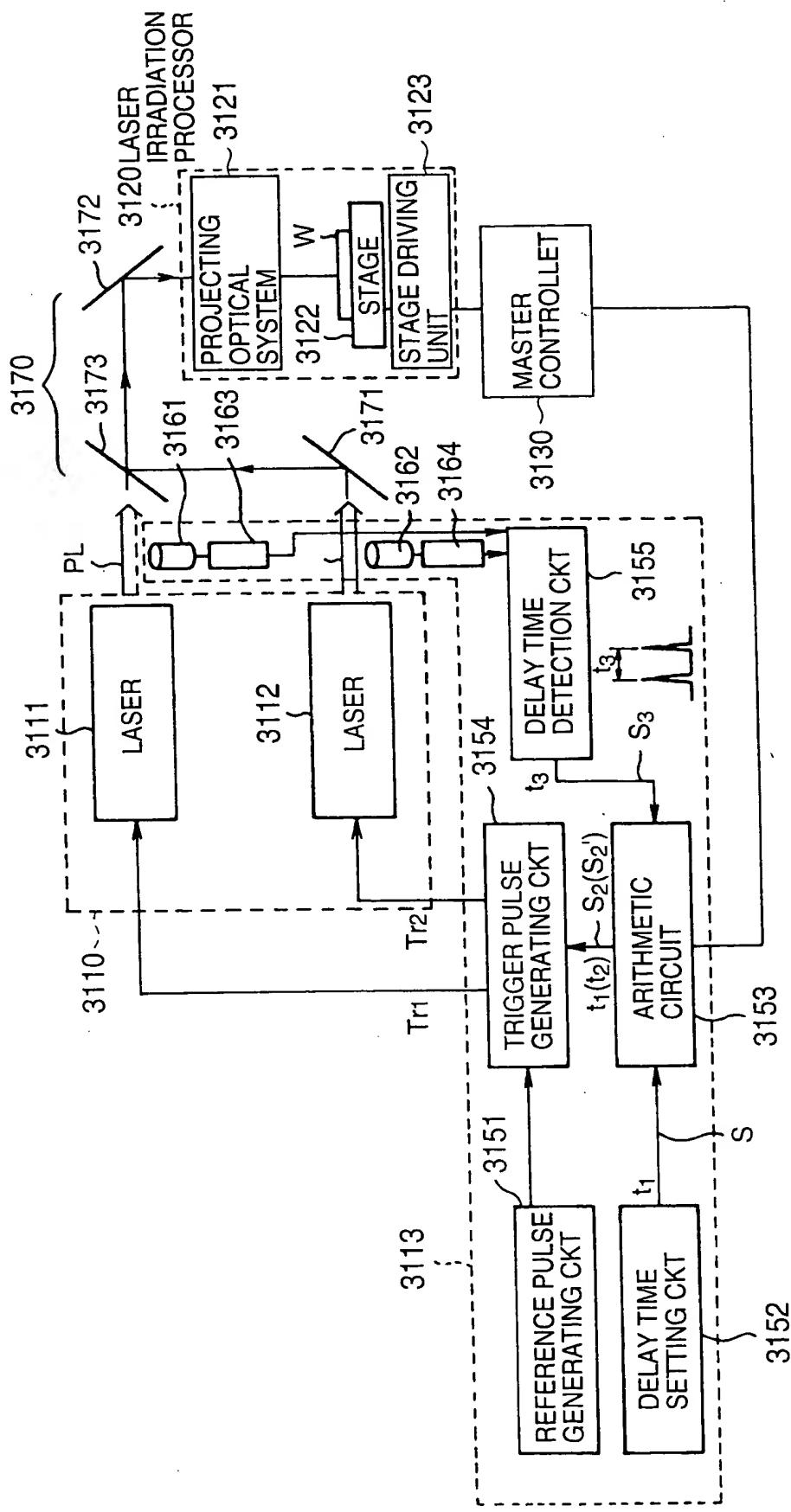


FIG. 21

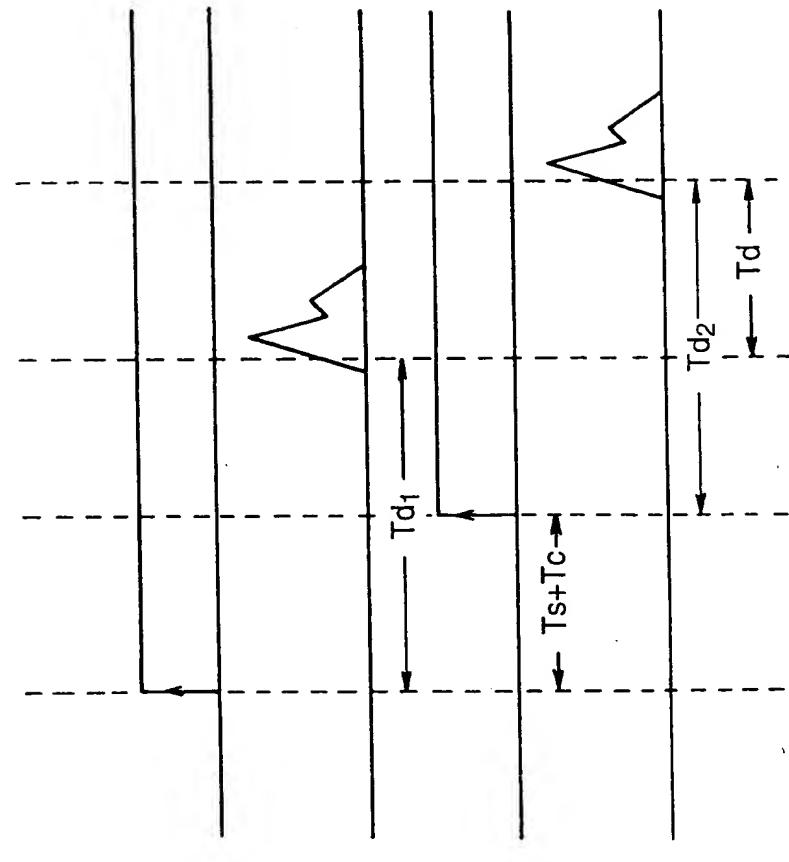


FIG.22A FIRST LASING TRIGGER

FIG.22B FIRST LASING PULSE

FIG.22C TRIGGER DELAY CIRCUIT  
OUTPUT/SECOND  
LASING TRIGGER

FIG.22D SECOND LASING PULSE

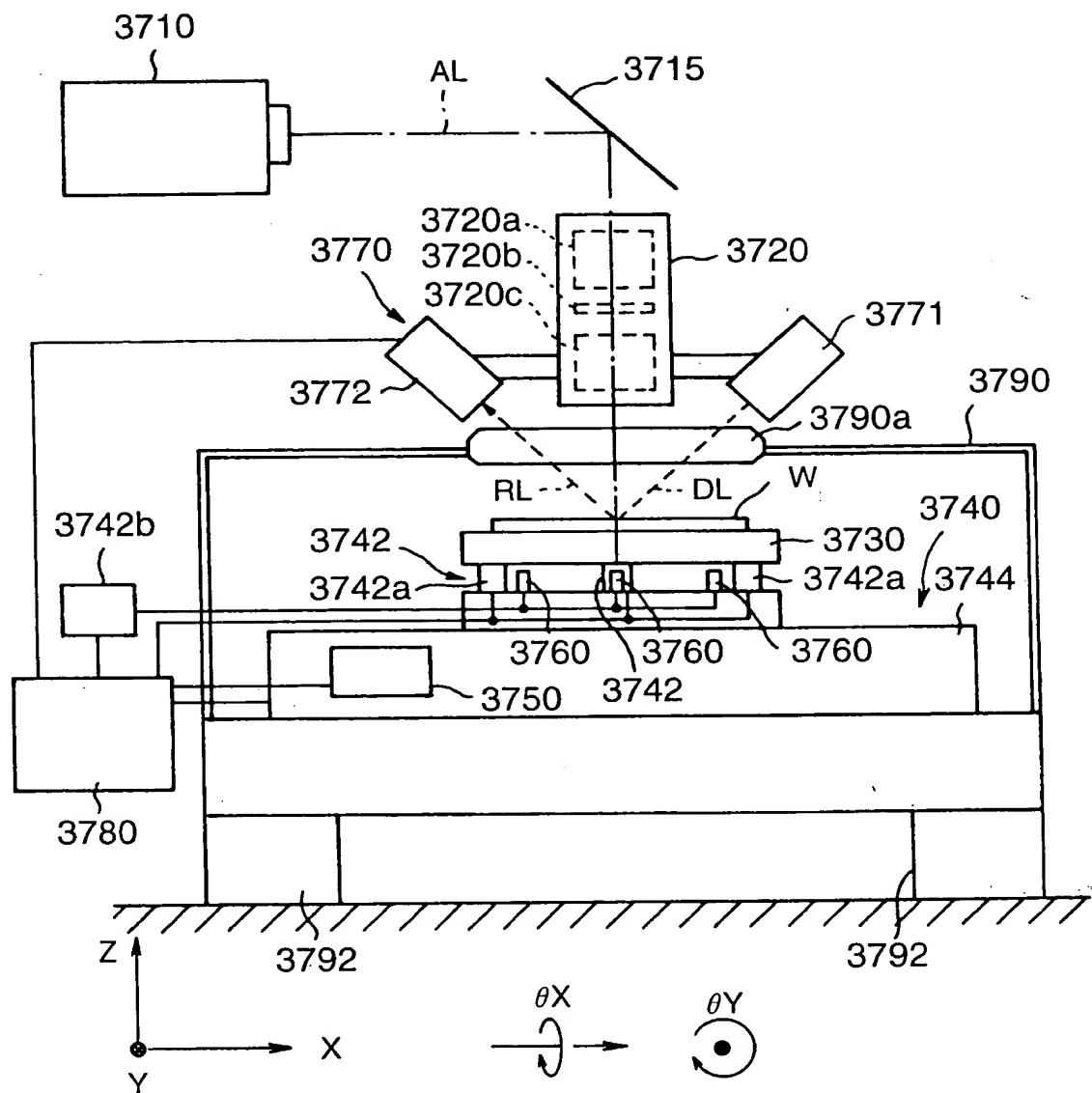


FIG.23

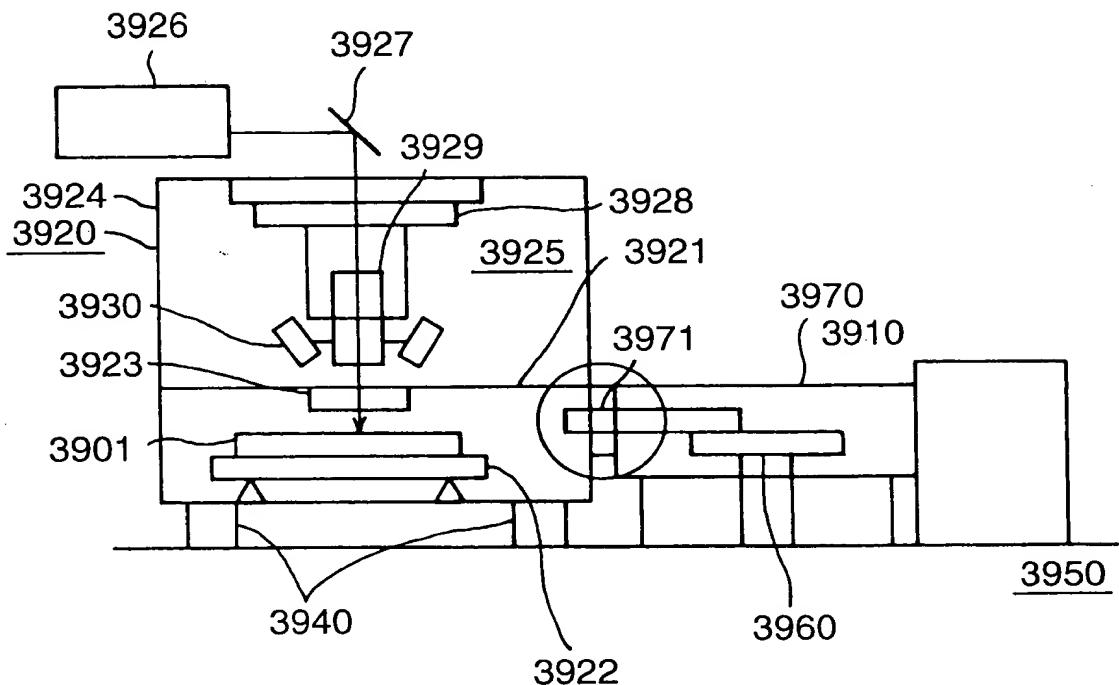


FIG.24

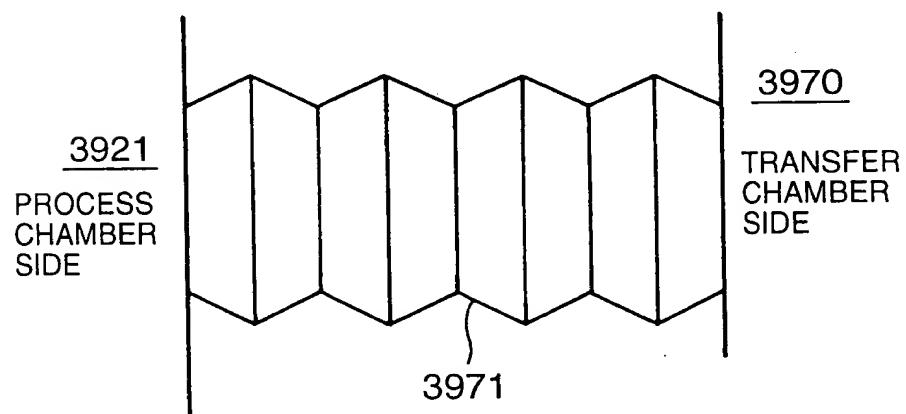


FIG.25

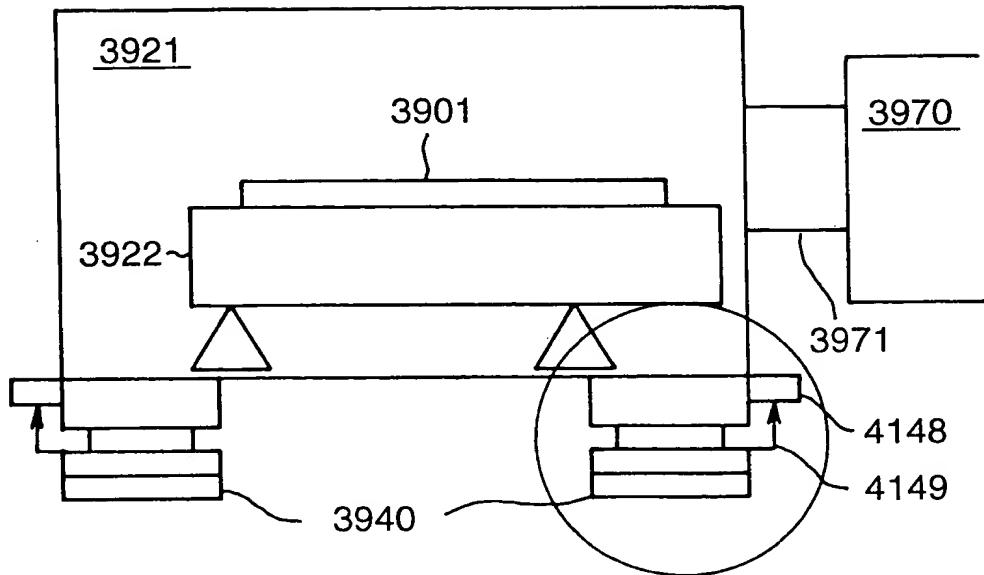


FIG.26

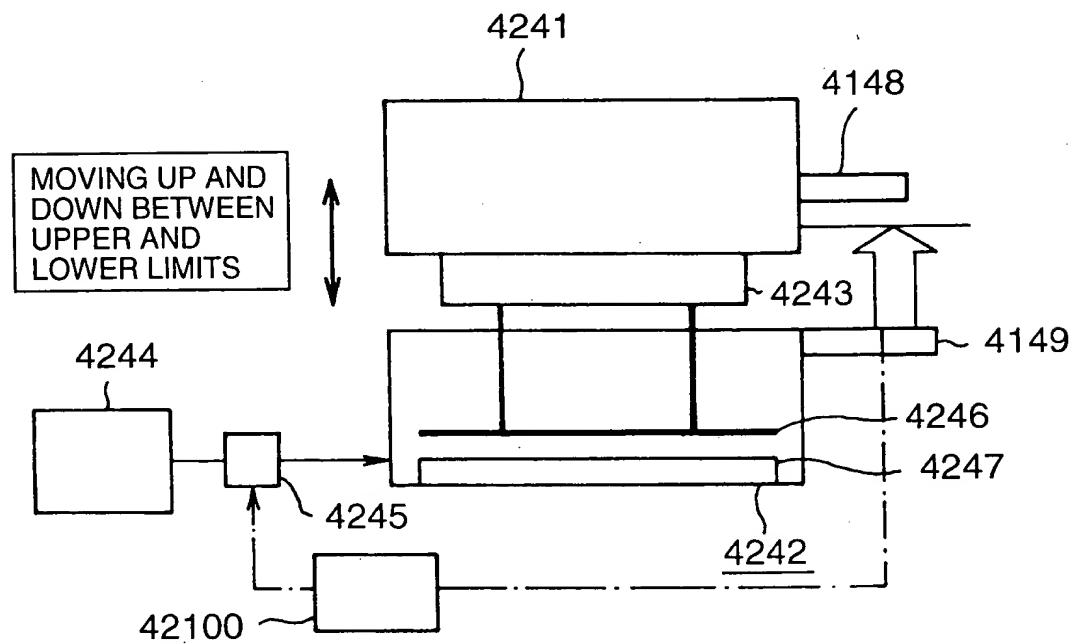


FIG.27

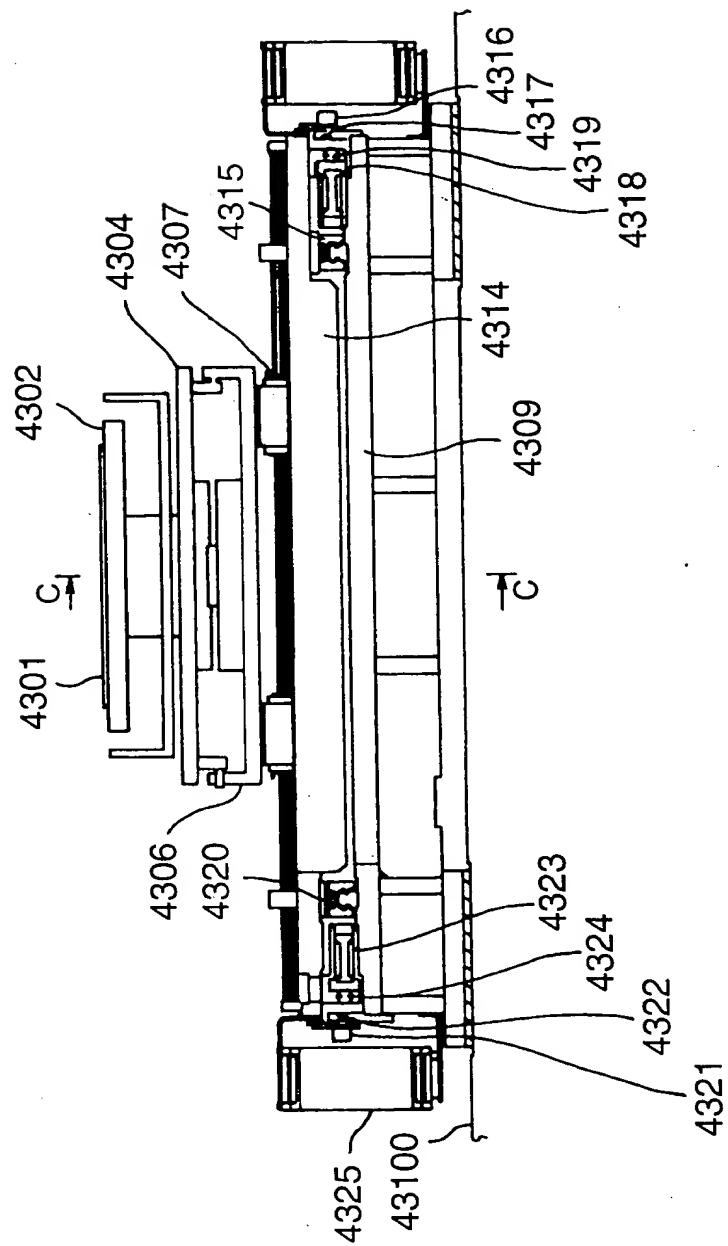


FIG.28

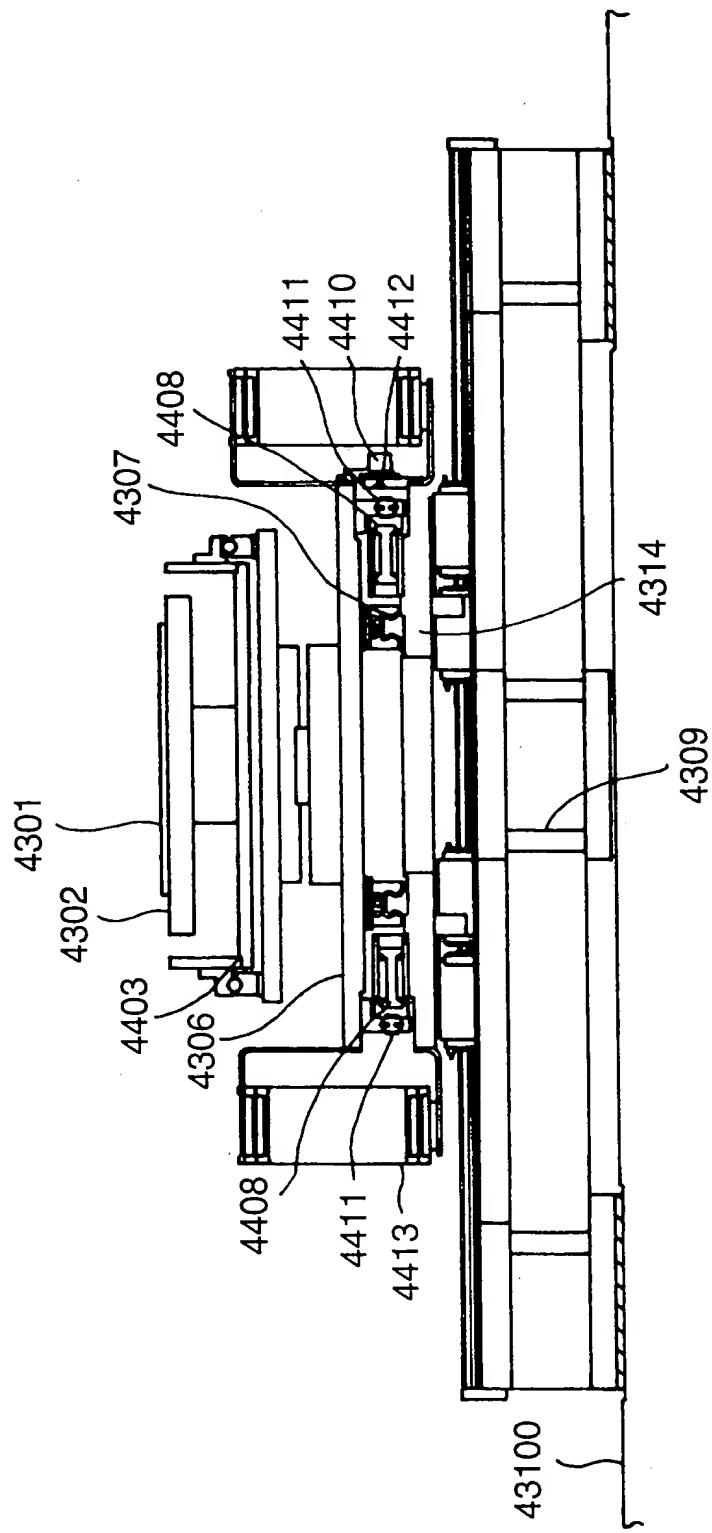


FIG.29

C-C

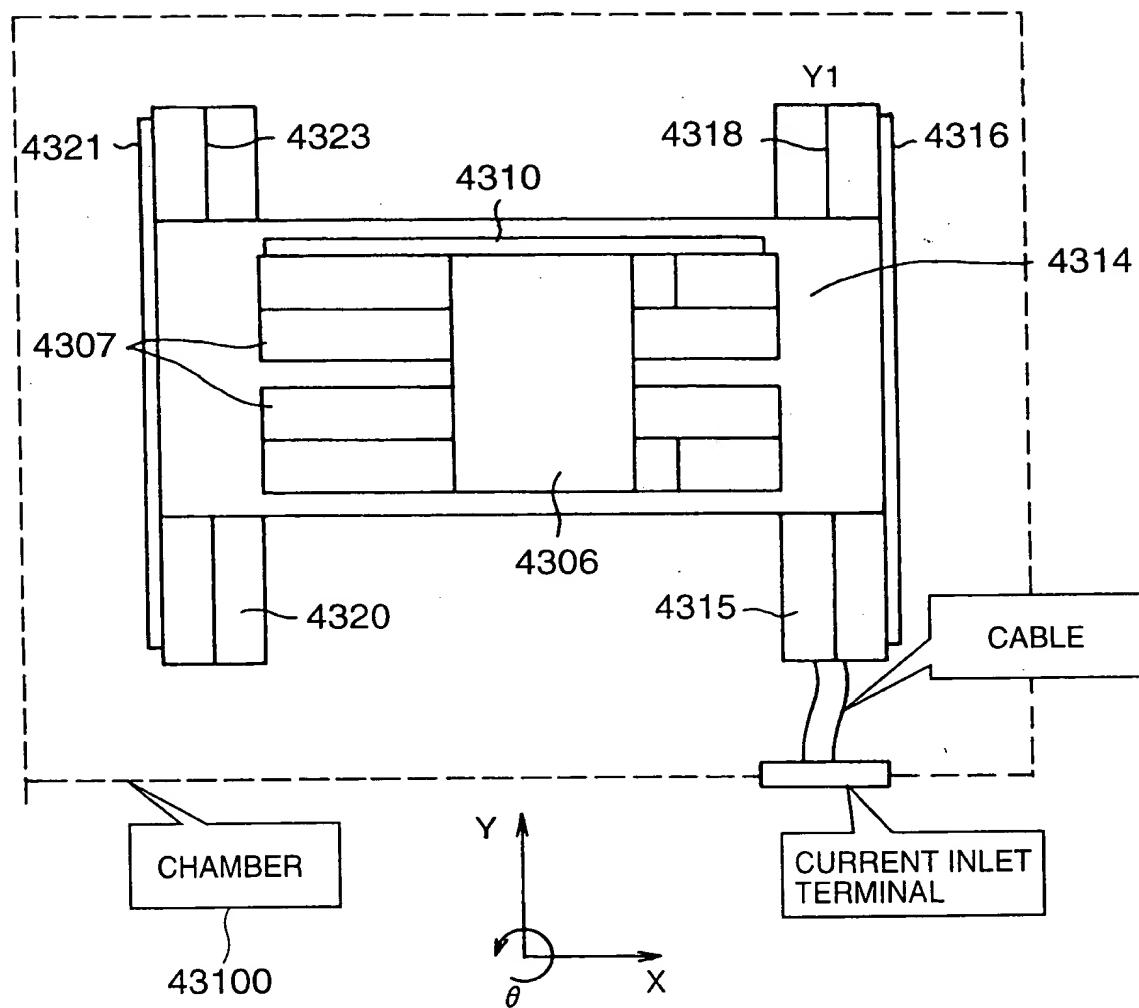


FIG.30

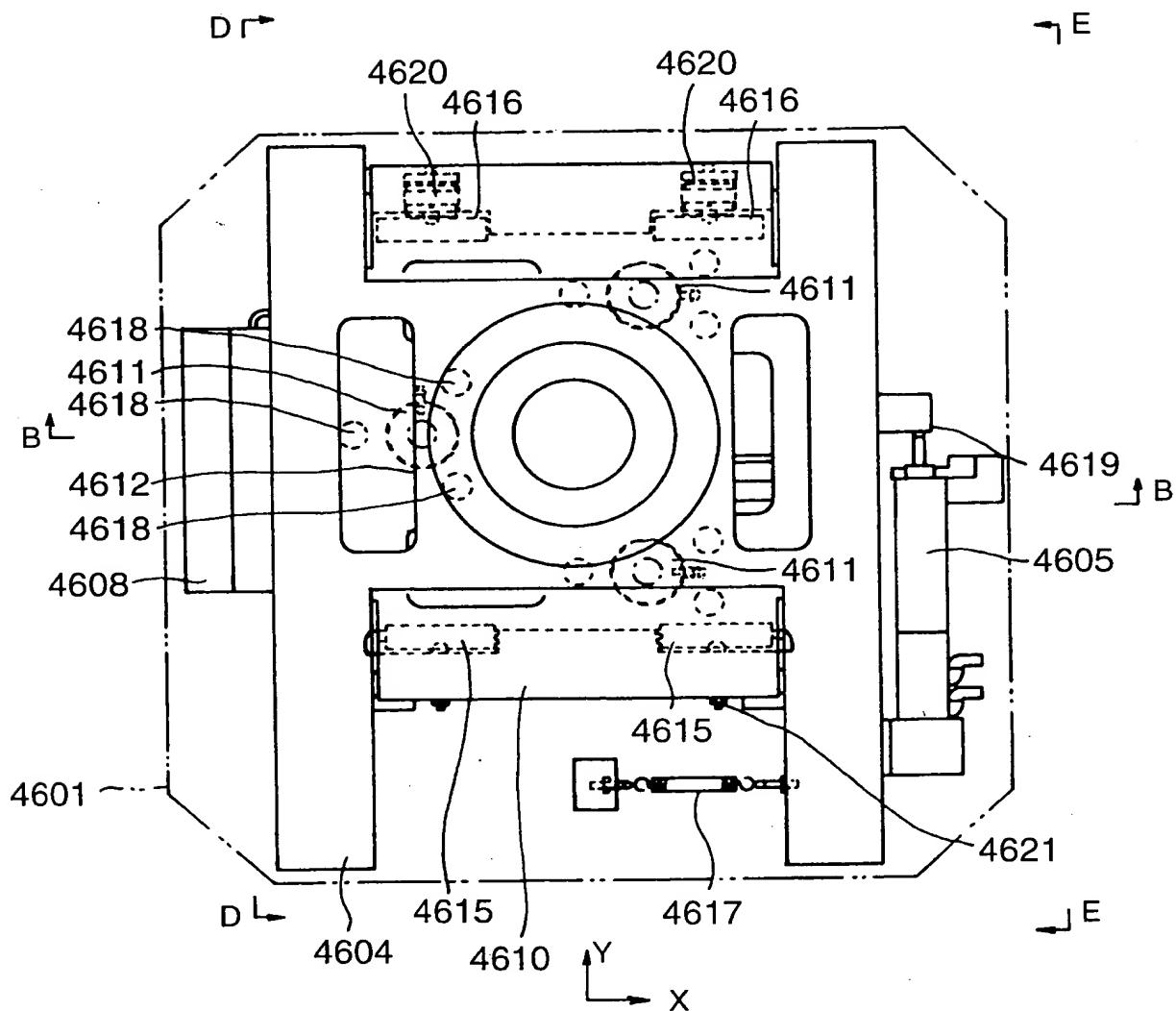


FIG.31

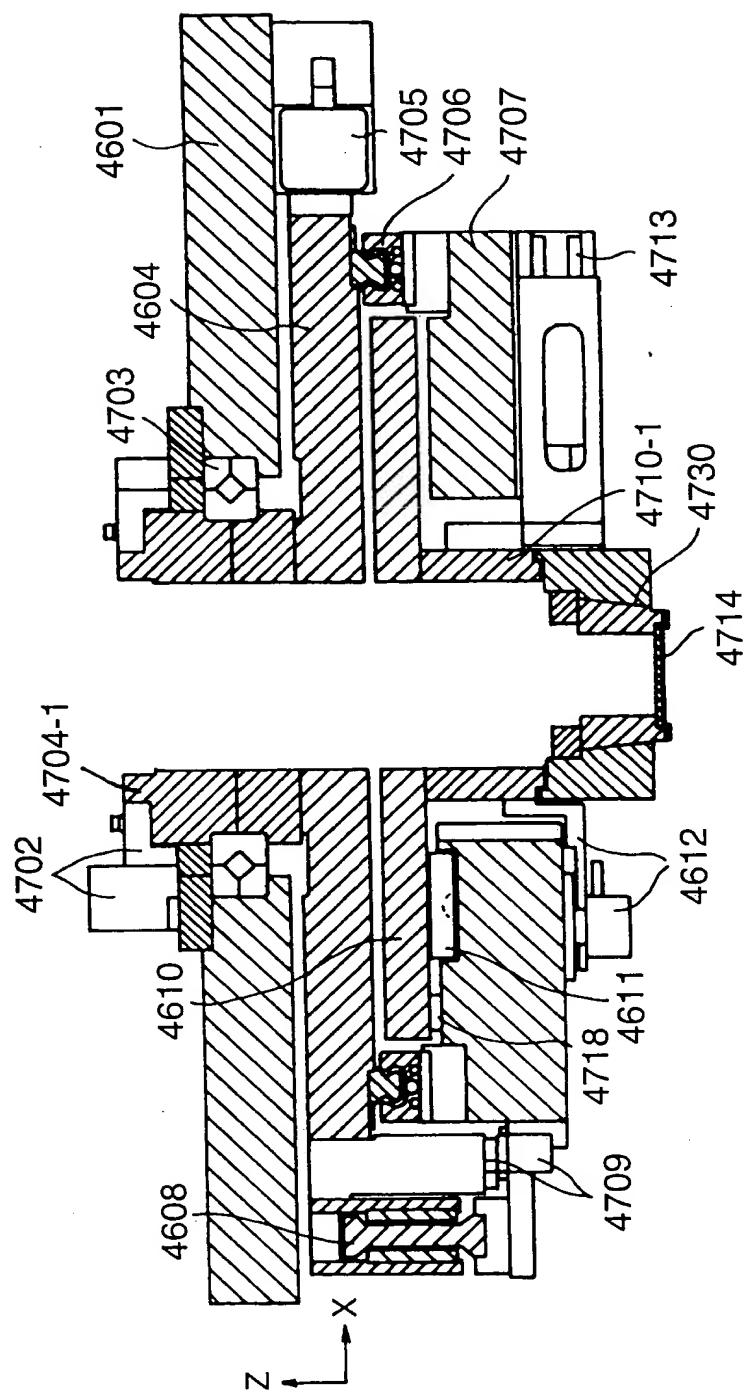
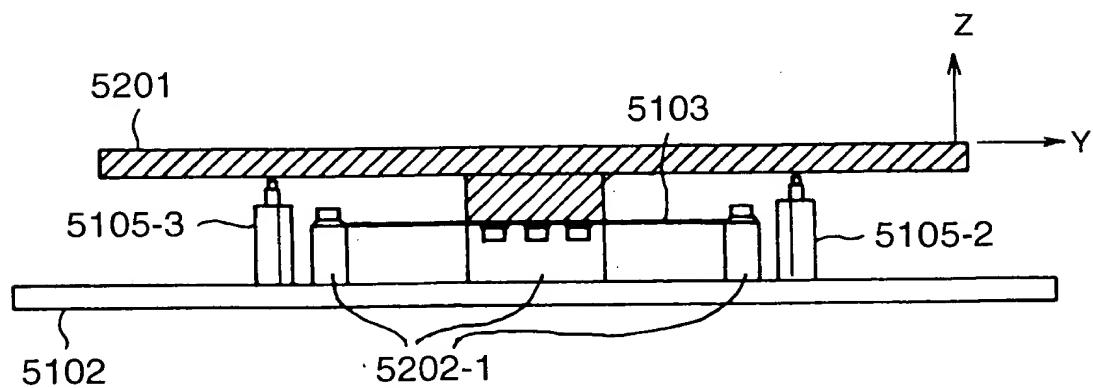
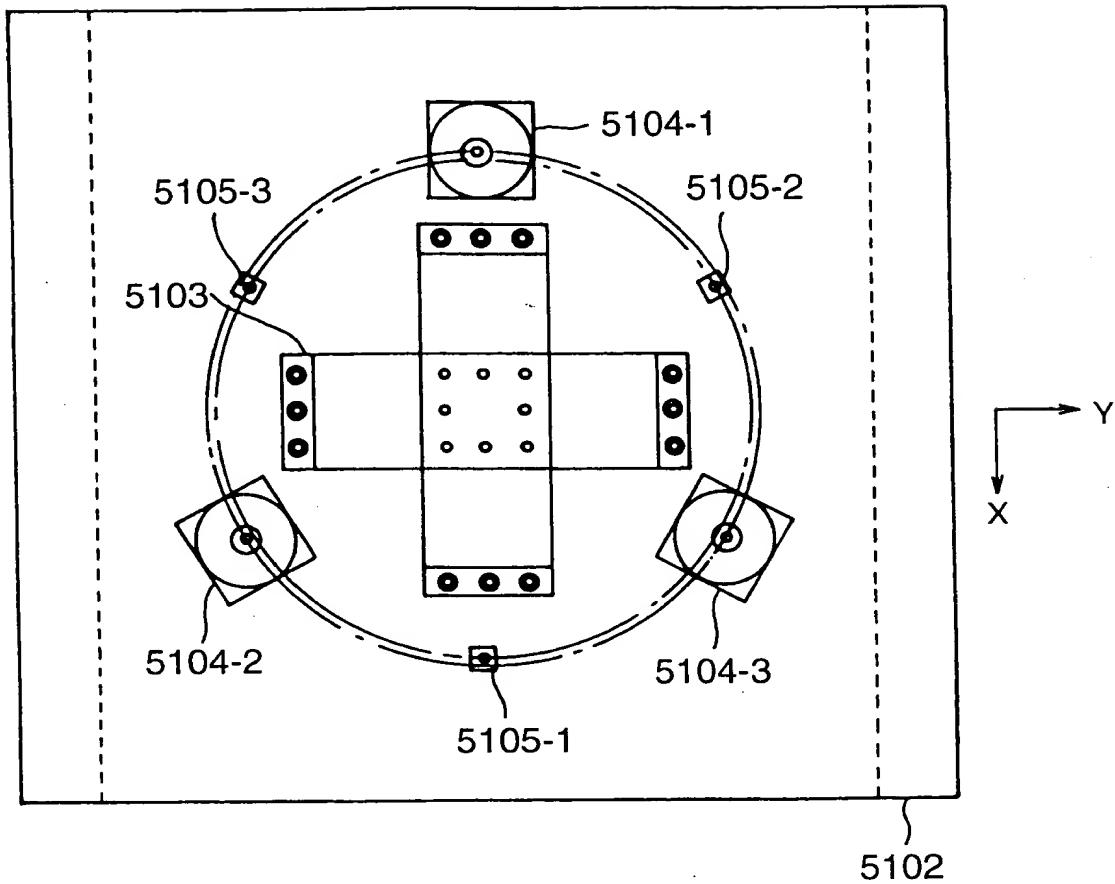


FIG.32



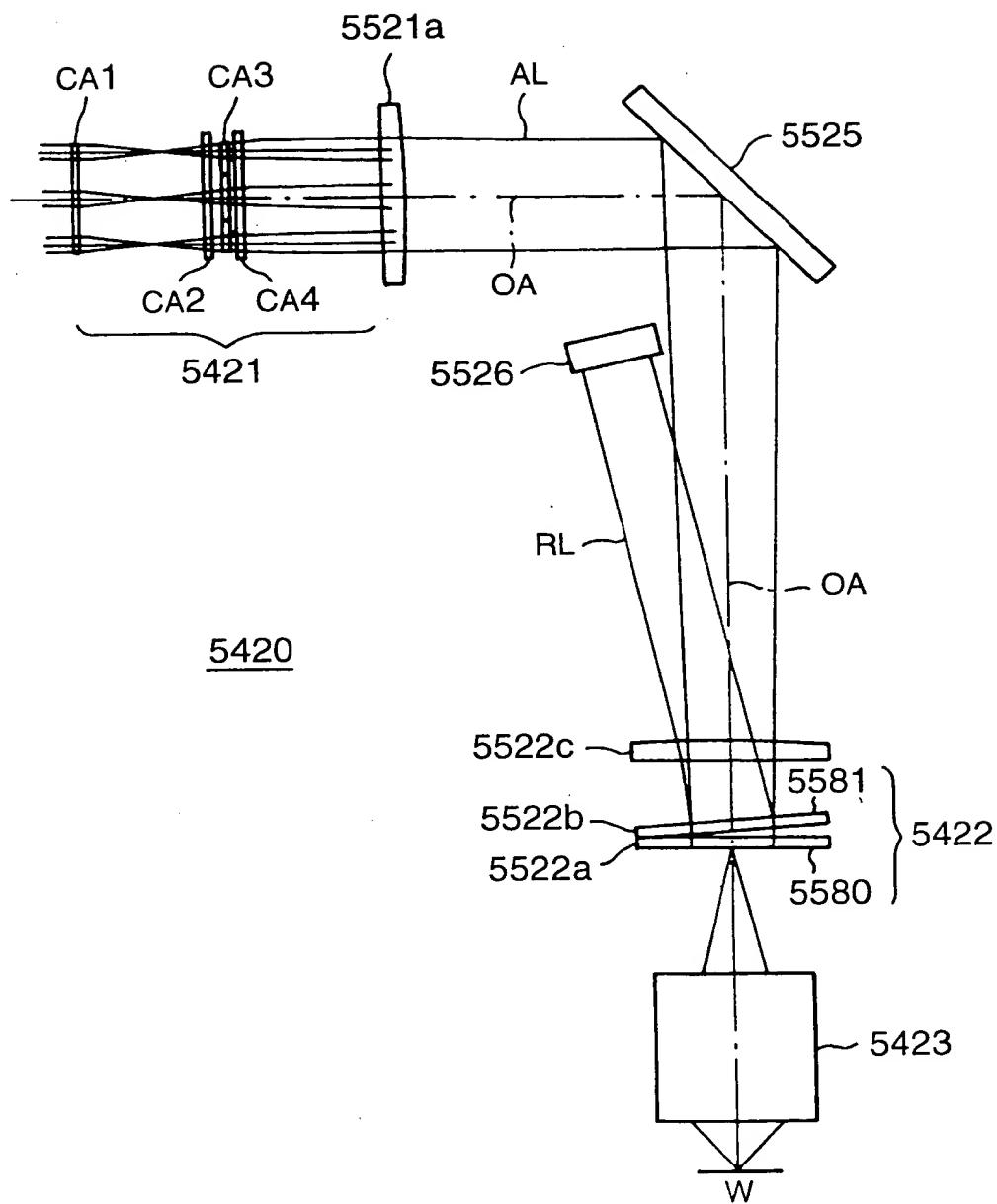


FIG.35

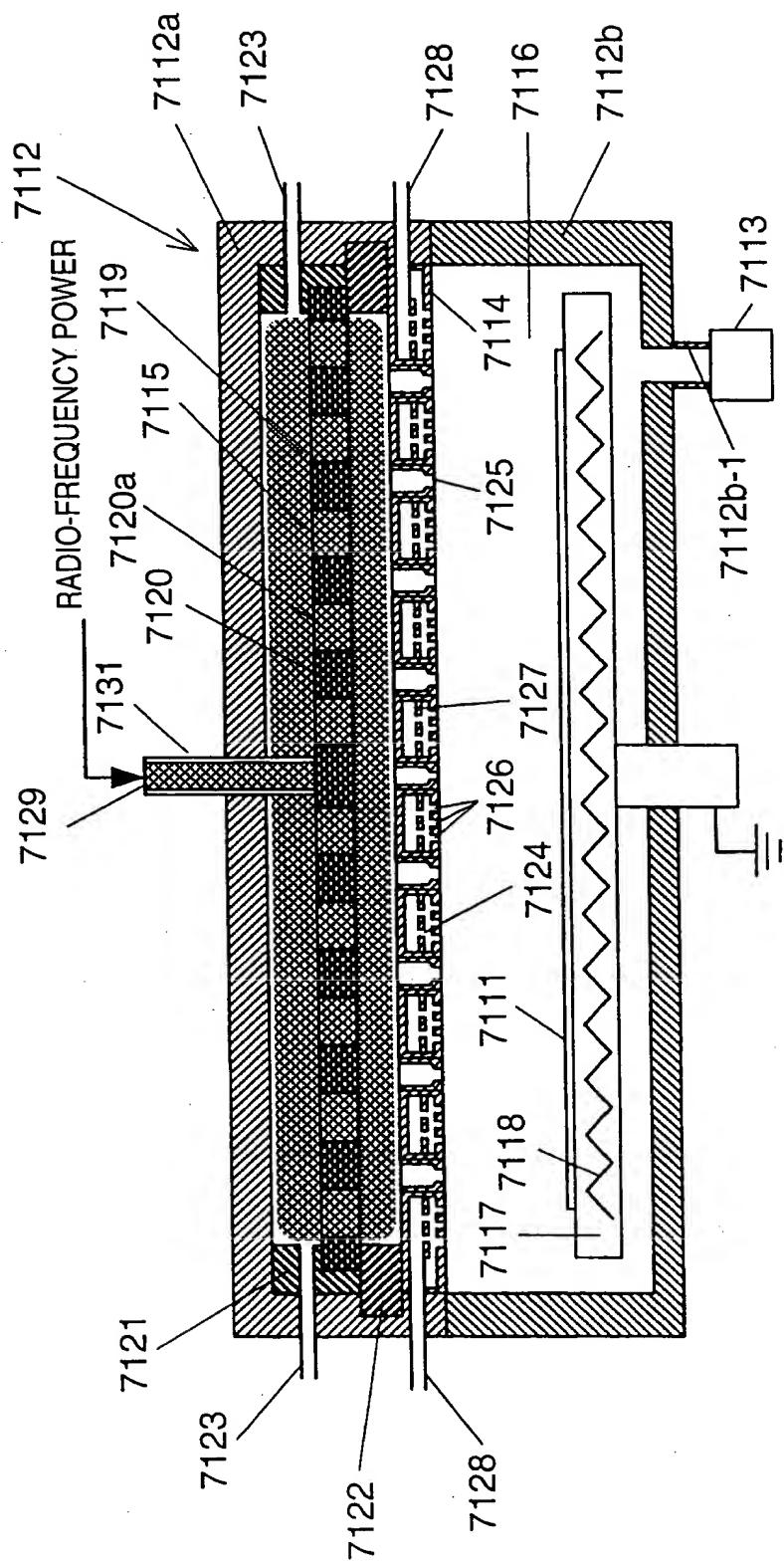


FIG.36

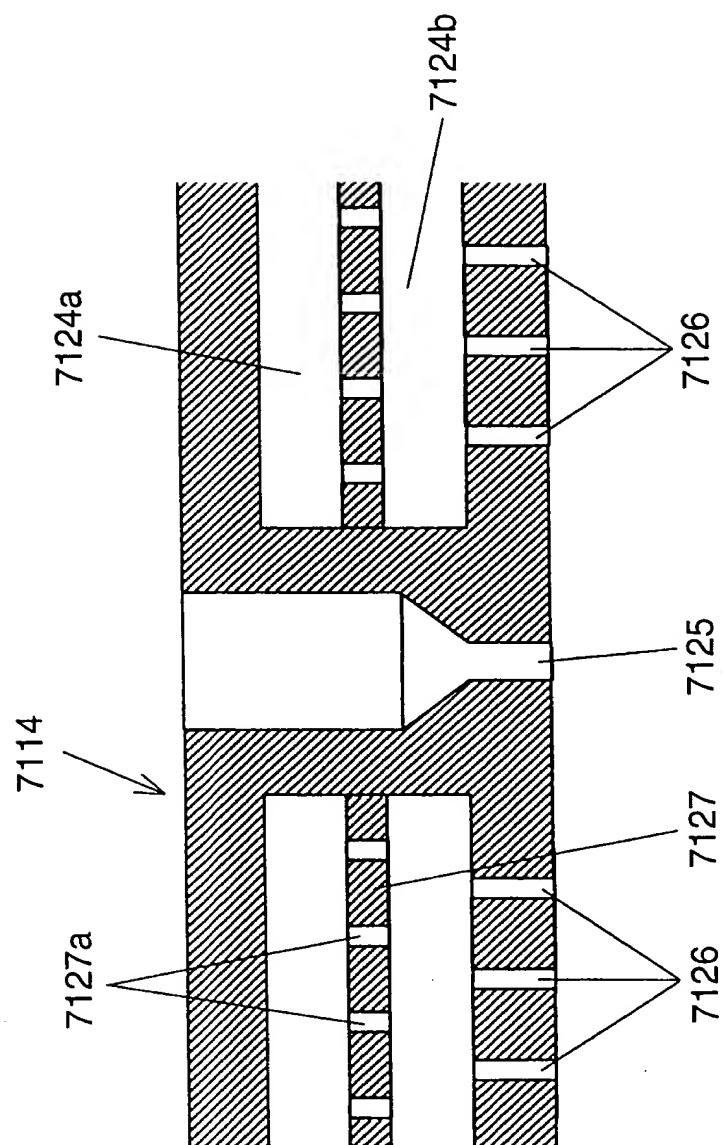


FIG.37

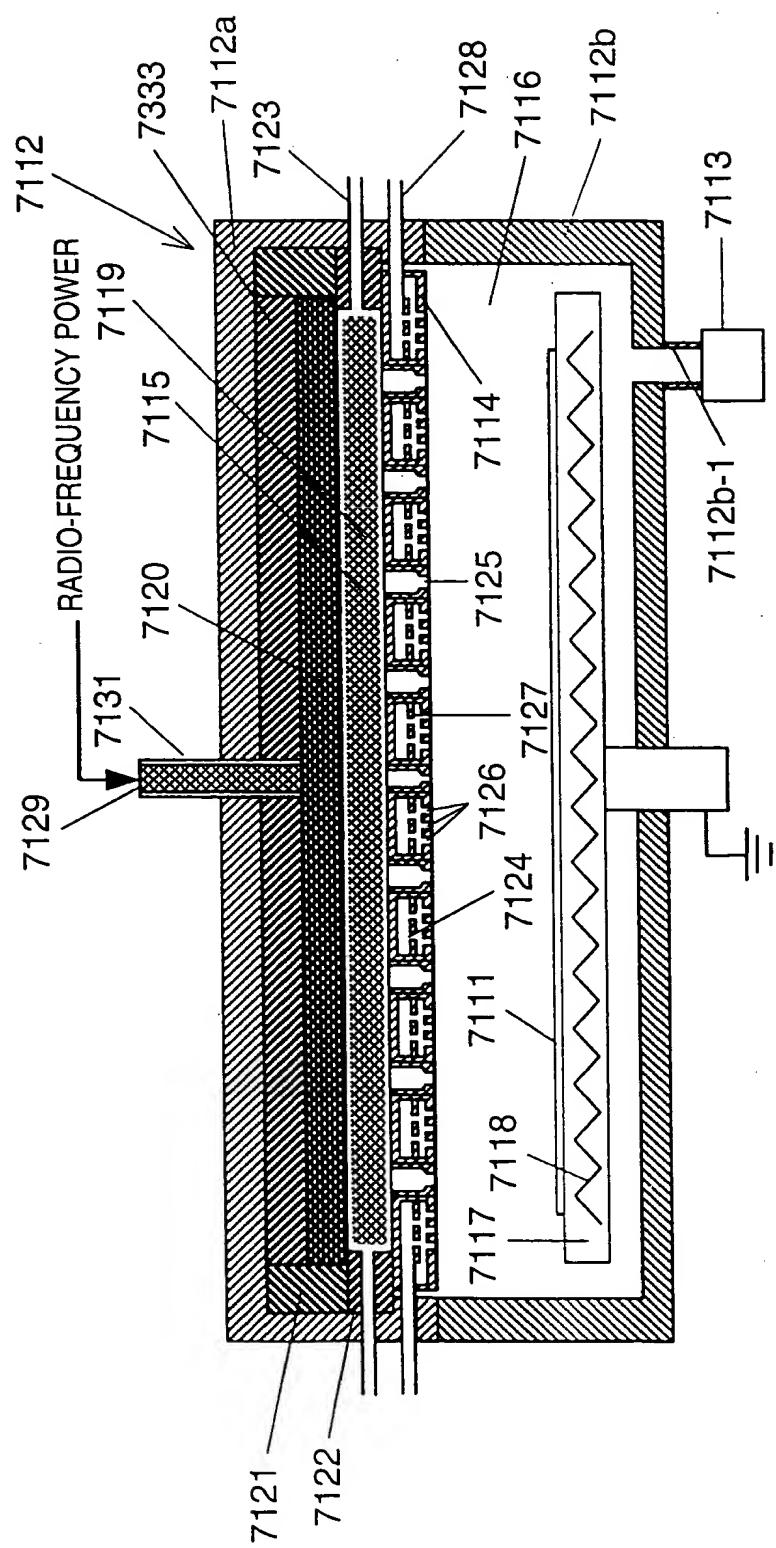


FIG.38

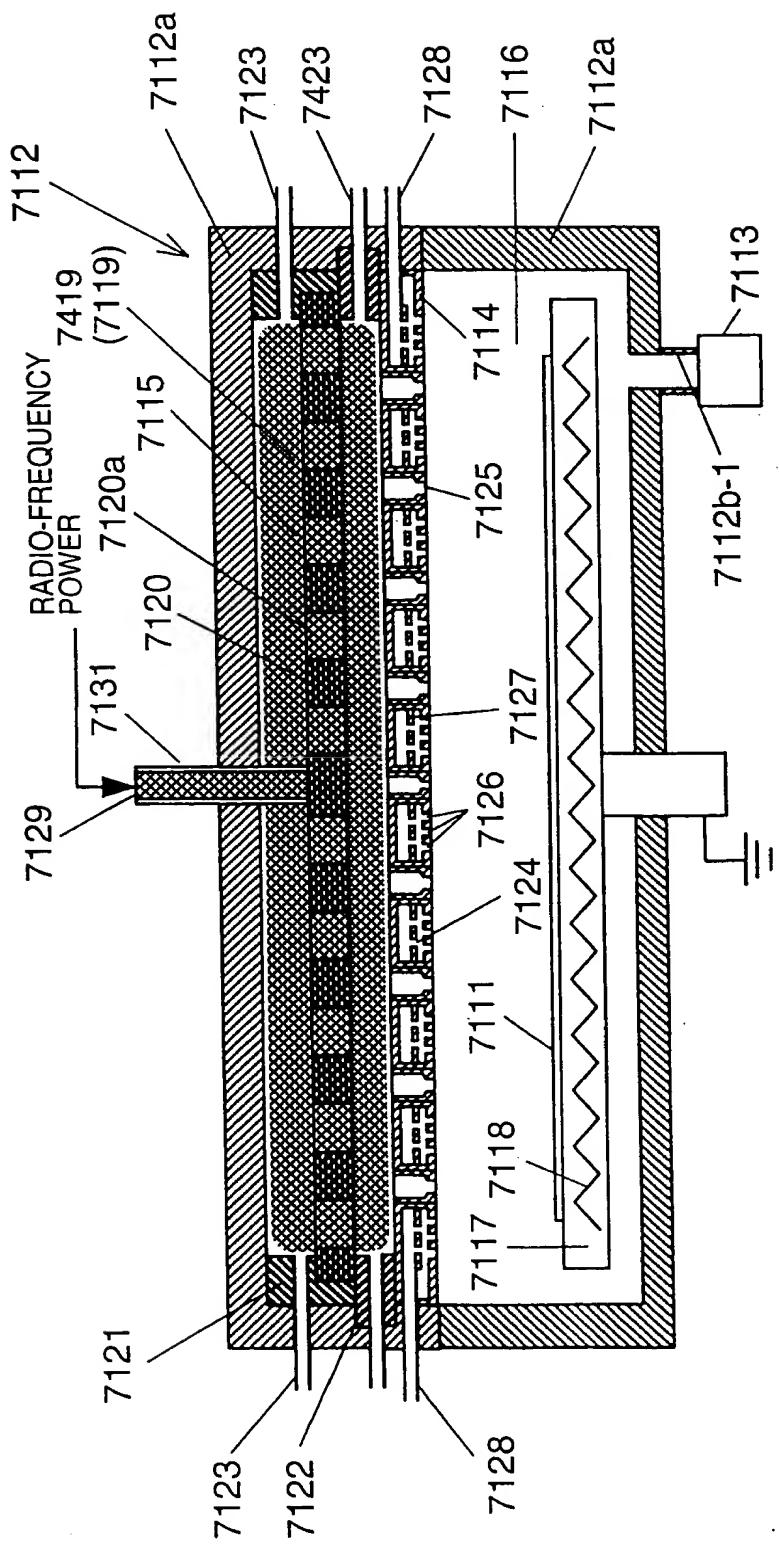


FIG. 39

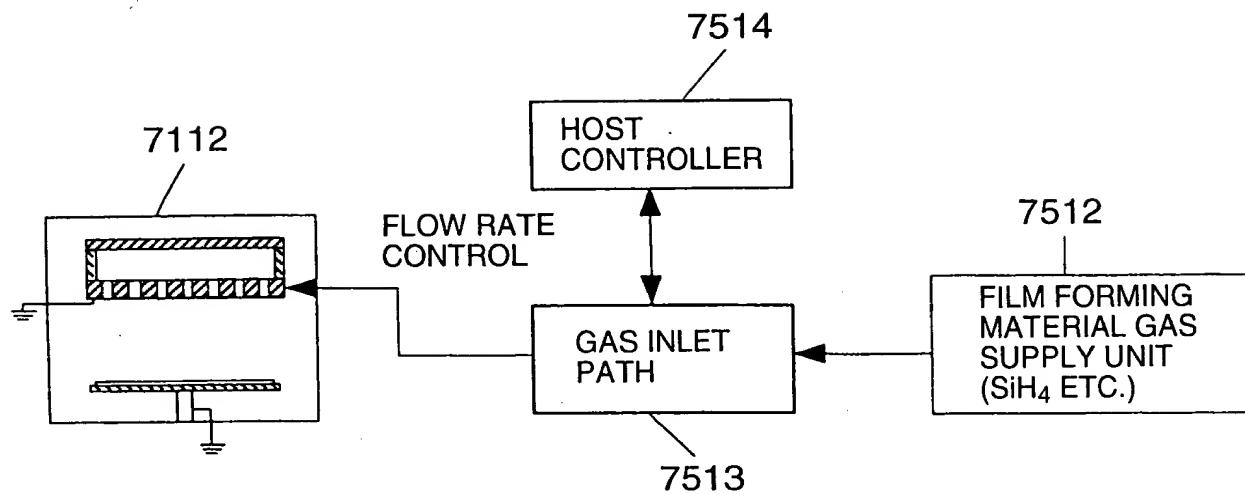


FIG.40

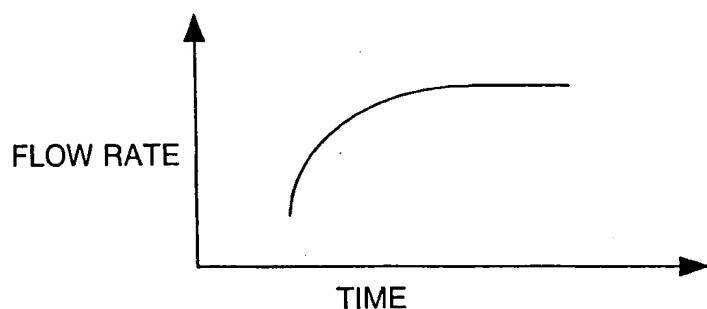
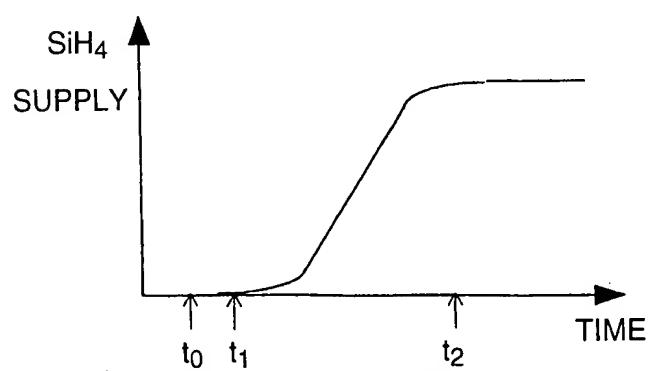


FIG.41



$t_0$  : START OF O<sub>2</sub> DISCHARGE  
 $t_1$  : START OF SiH<sub>4</sub> SUPPLY  
 $t_2$  : SiH<sub>4</sub> SUPPLY ATTAINS A CONSTANT LEVEL

FIG.42

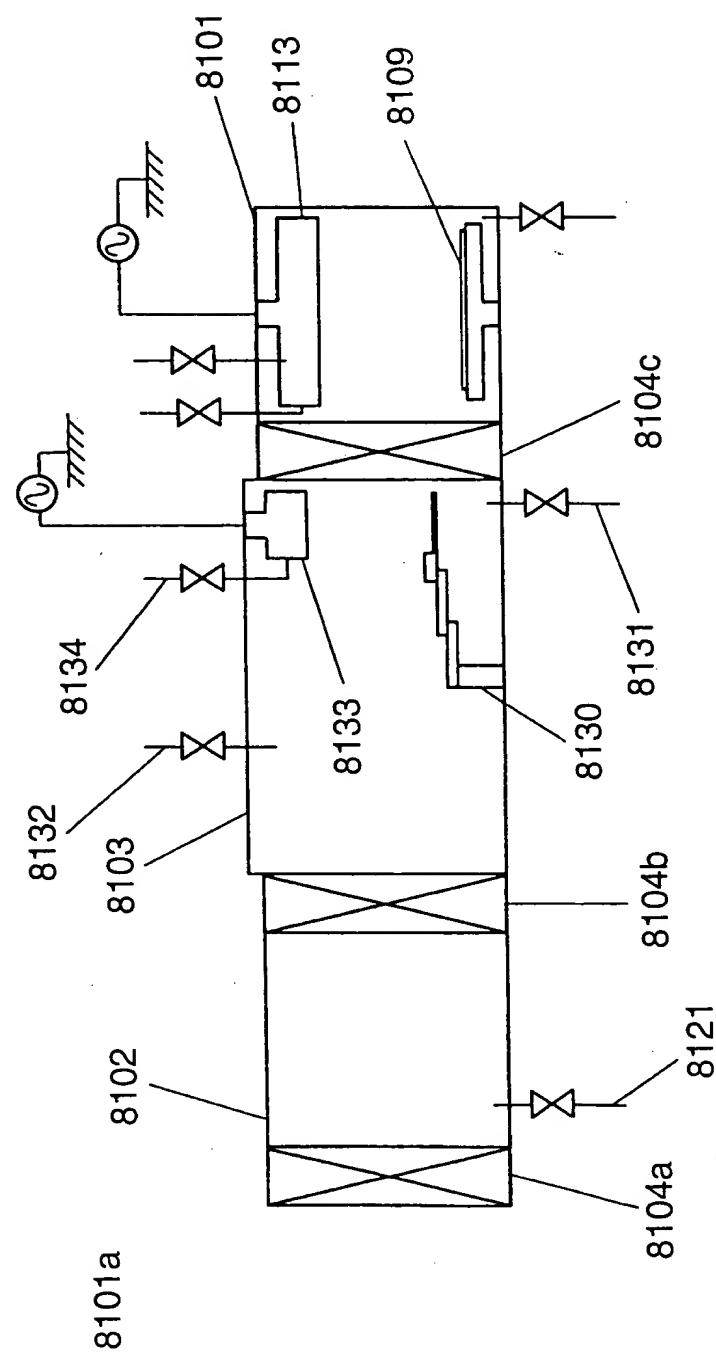
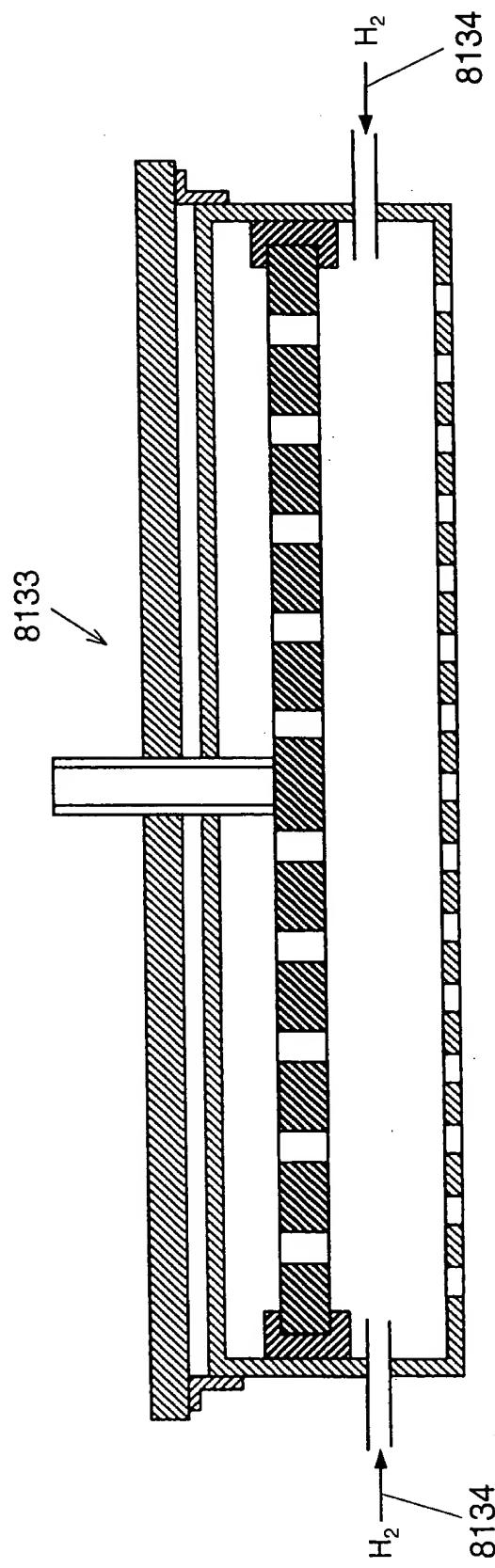


FIG. 43

FIG.44



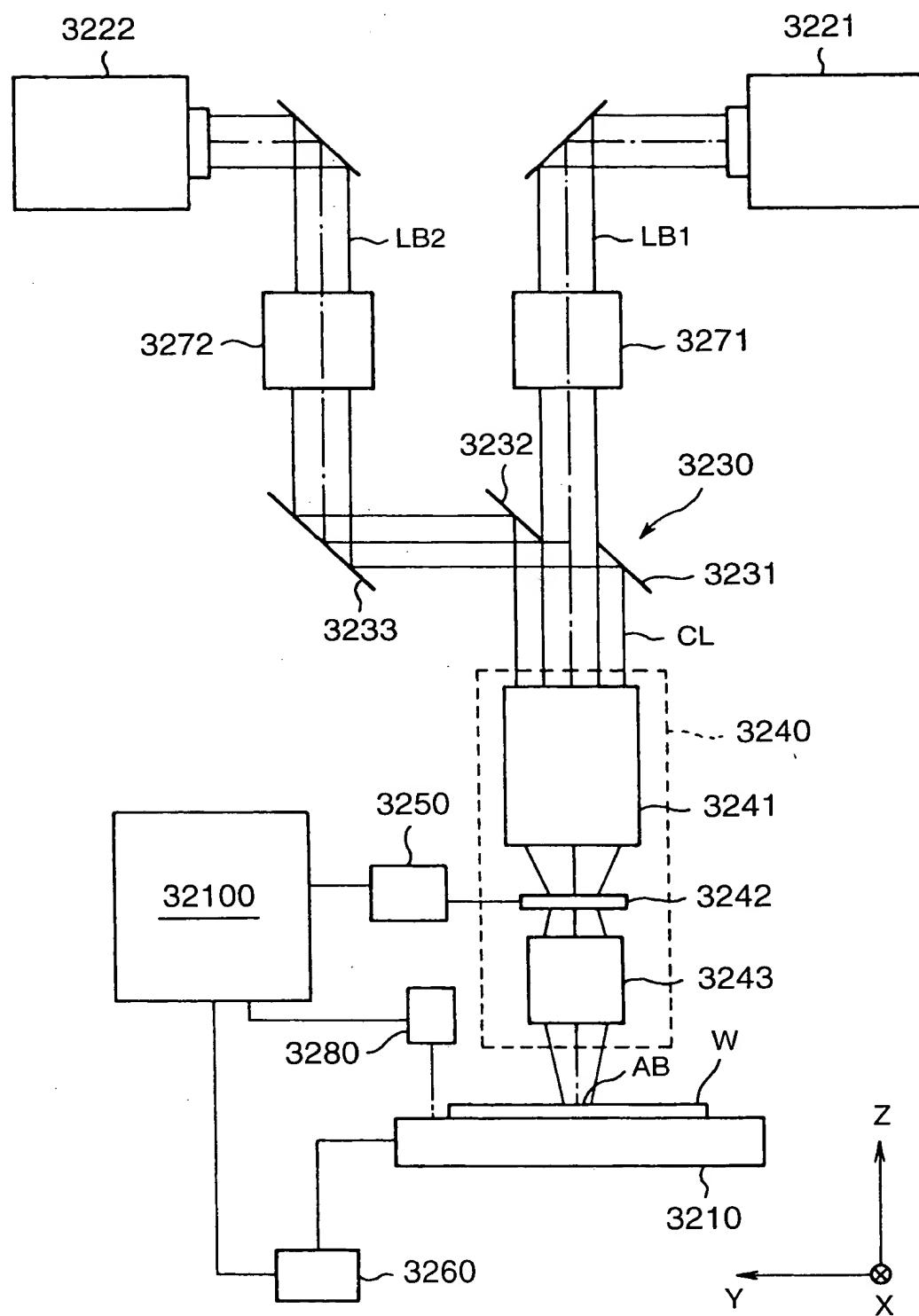


FIG.45

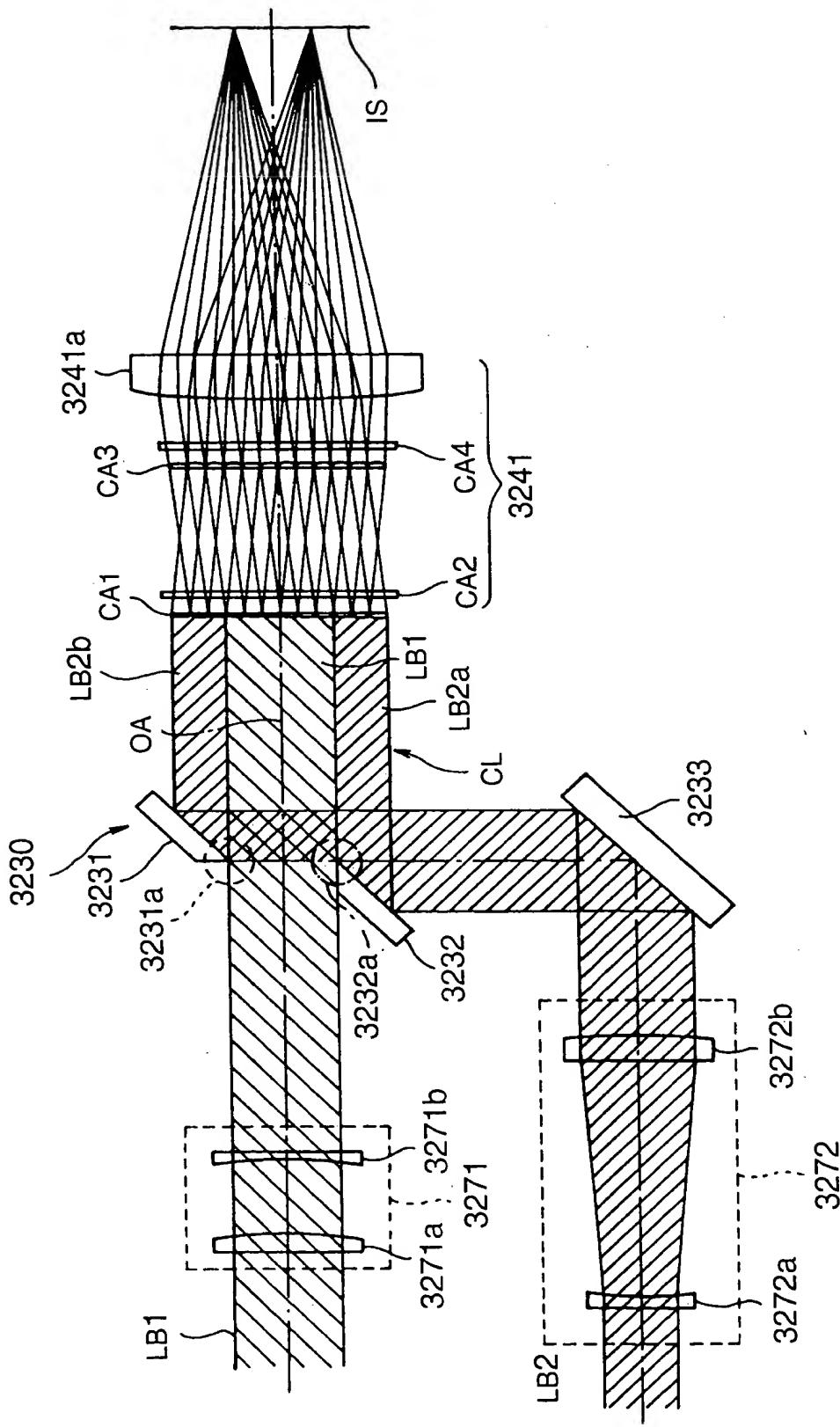


FIG. 46

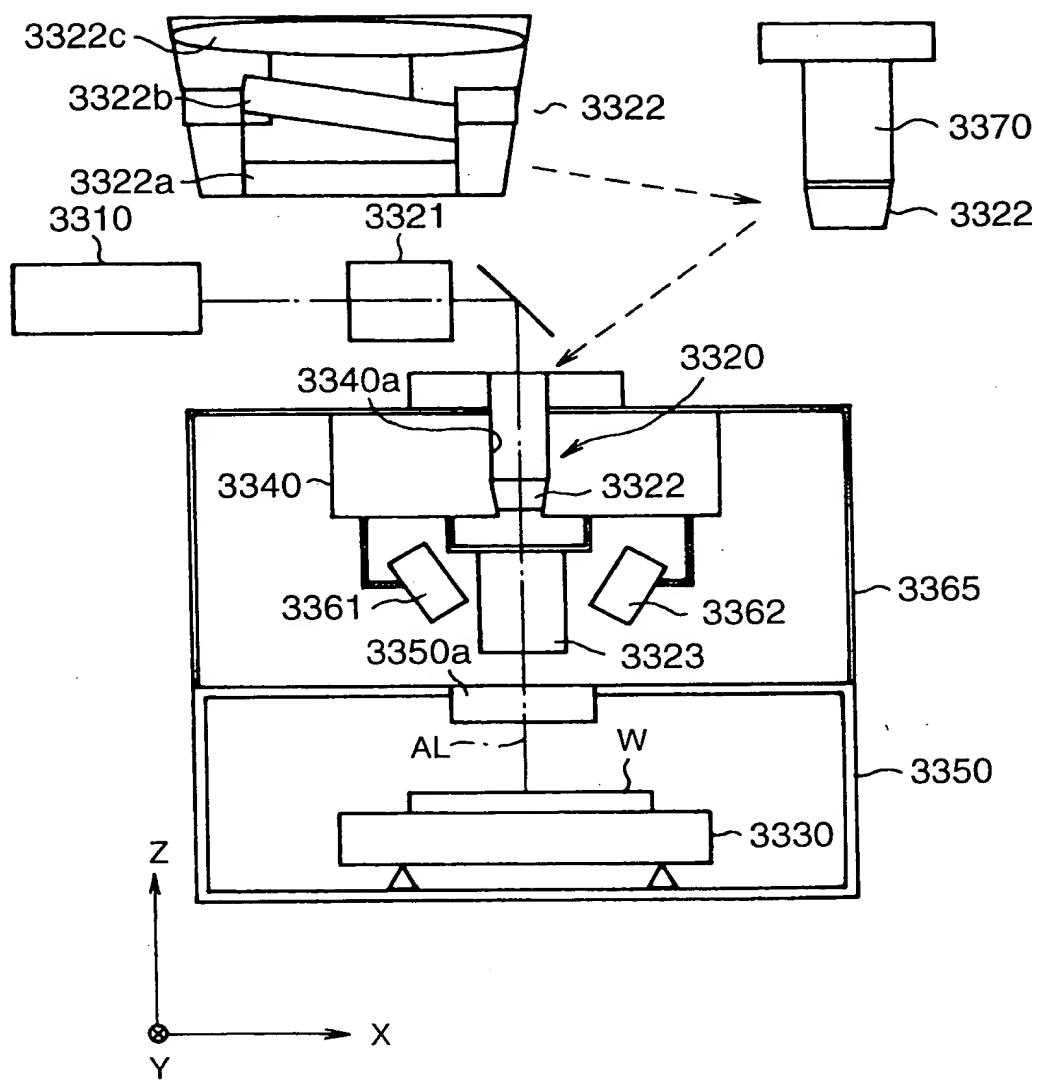


FIG. 47

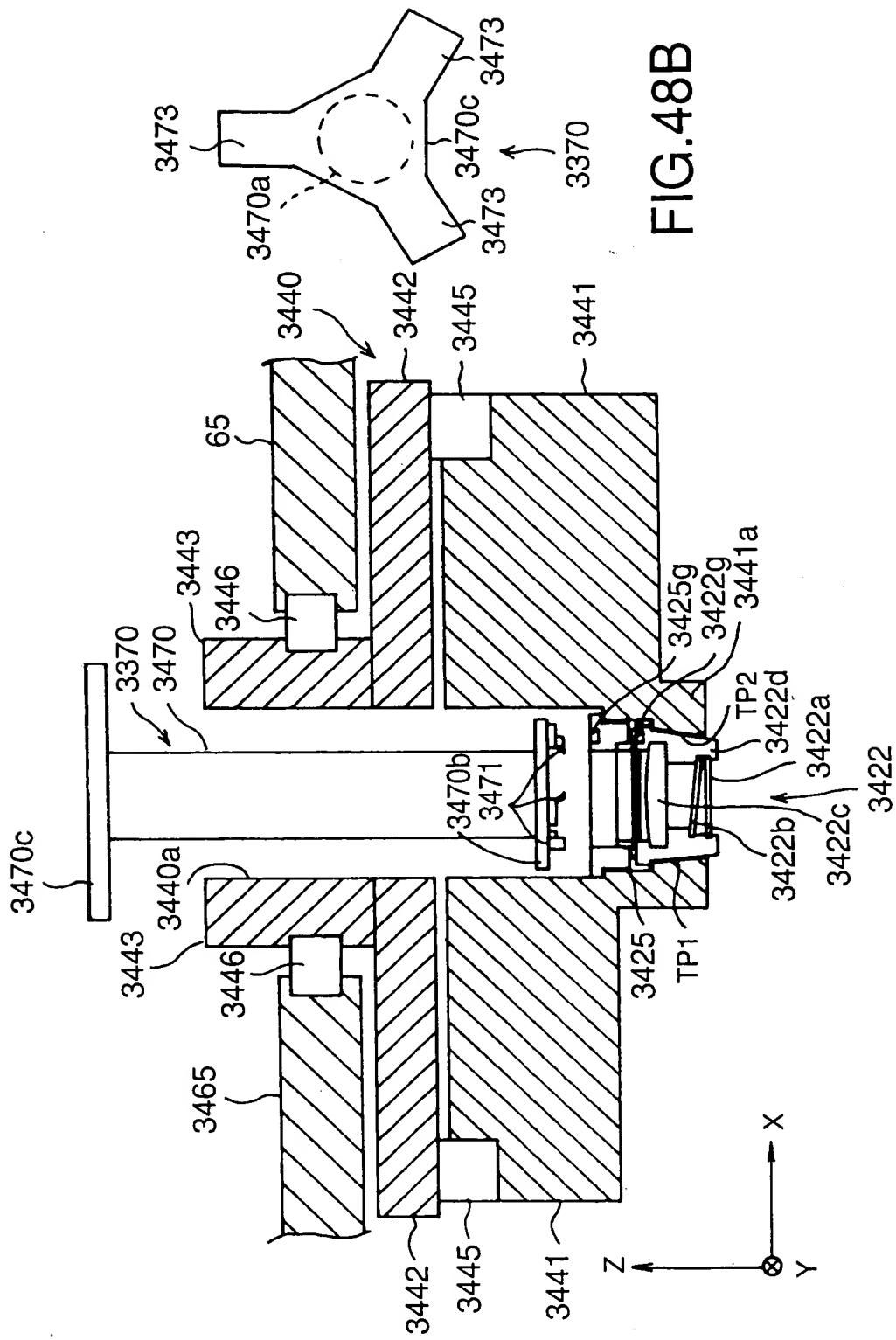


FIG. 48A

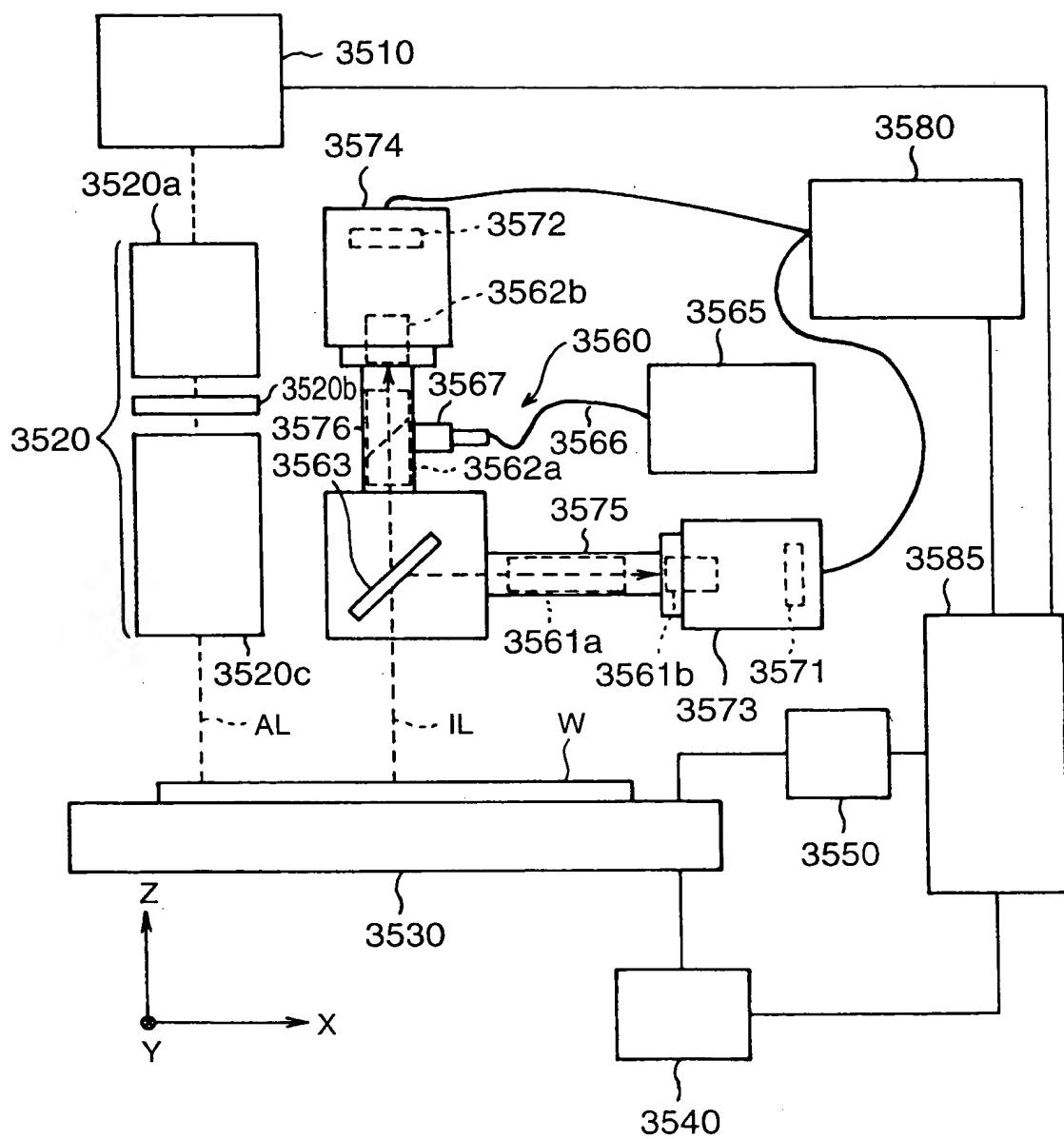
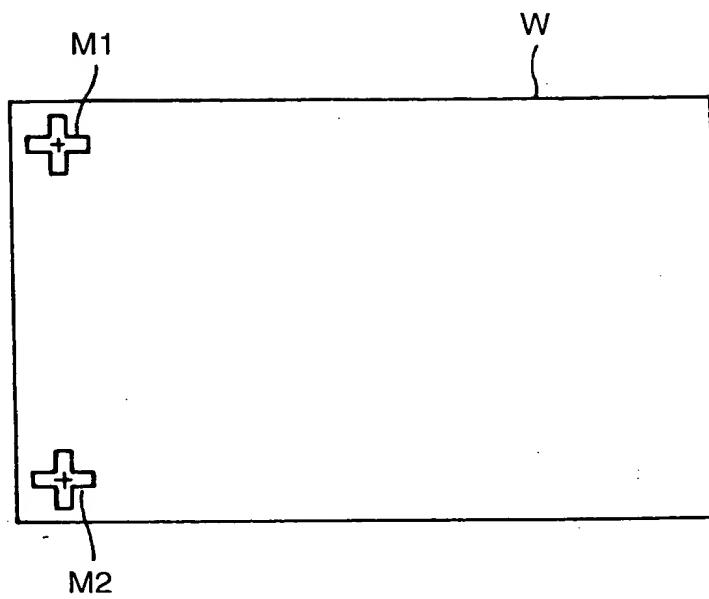


FIG.49



**FIG.50**

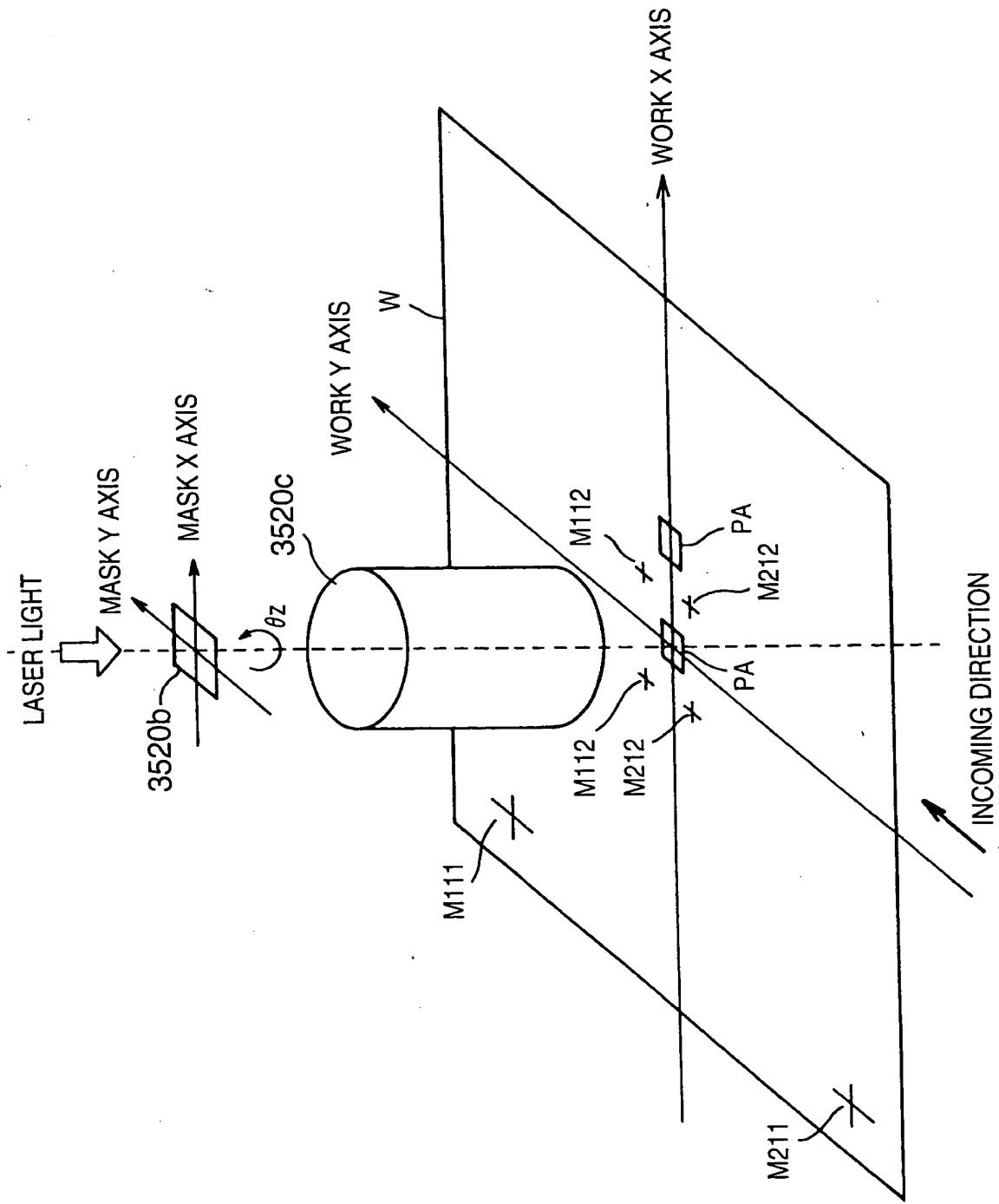


FIG.51

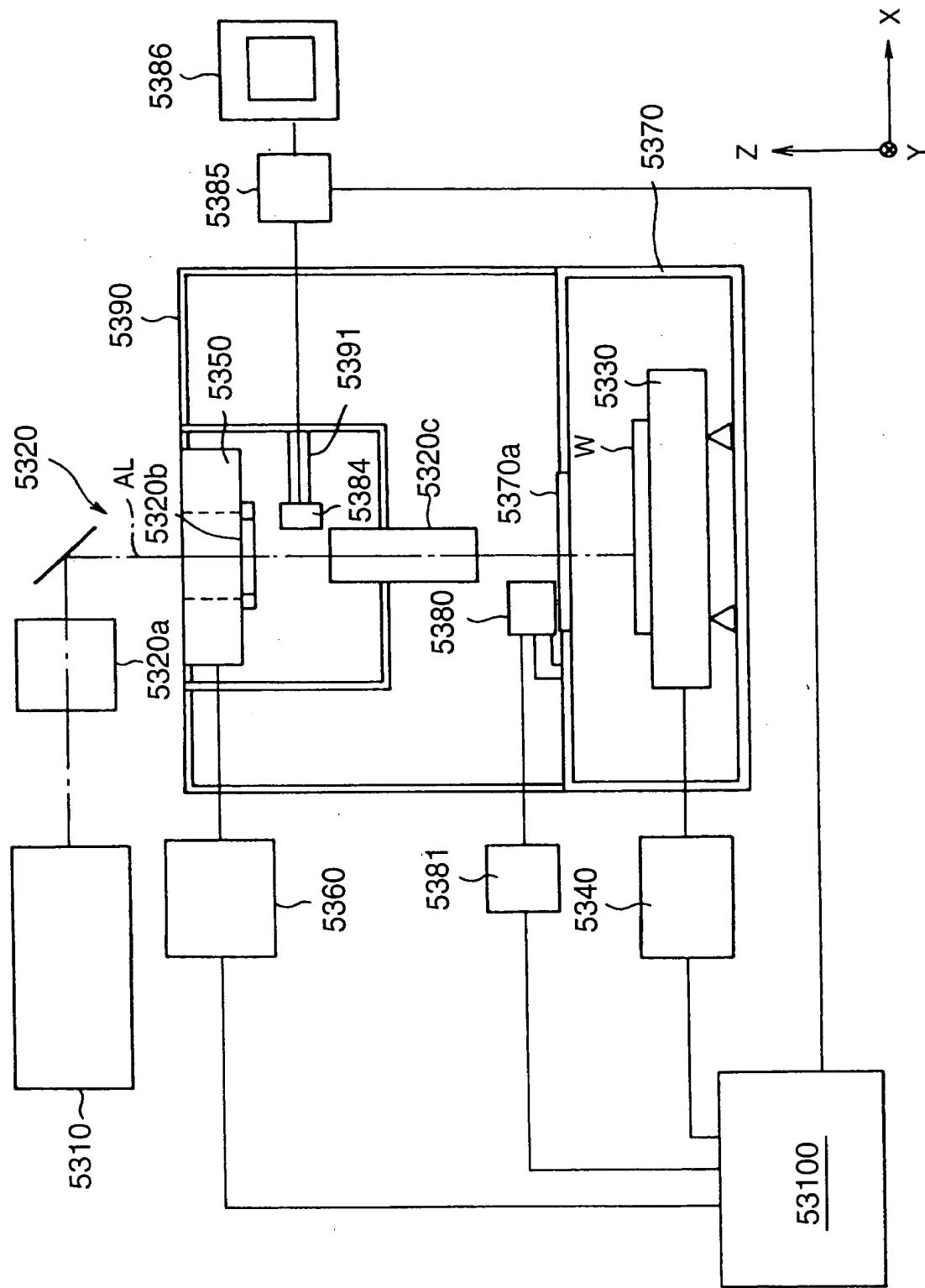


FIG. 52